

VIRGINIA WILDLIFE

APRIL 2006

TWO DOLLARS





Colonel W. Gerald Massengill

Interim Director

In a couple of weeks the spring gobbler hunting season will open across the Commonwealth and the Virginia Department of Game and Inland Fisheries wants to remind hunters that an enjoyable day in the woods begins with hunting safely.

The Department continues to work hard each year to insure that hunting is a safe outdoor activity and that the hunting public is aware of laws and regulations that help foster a safe hunting experience. The vast majority of the nearly 300,000 hunters that go afield in Virginia each year do so safely. However, some incidents do occur that can result in an injury and at times are fatal. Without question, one accident is one too many, but what makes this doubly tragic is the fact that, in most cases, these incidents were preventable.

For the first time in 47 years or since the Department began keeping hunting incident reports, there were no hunting-related fatalities reported during the 2005 general firearms season. This important statistic is a testament to the Department's free Hunter Safety Education Program and the hundreds of volunteers who assist in teaching close to 15,000 participants each year. In most cases, parents accompany their sons and daughters and take the course together, each preparing to share in this traditional activity. The Hunter Safety Education program emphasizes hunting ethics, safety and individual responsibility. It is also a great way to learn more about wildlife identification, outdoor survival, first aid, how to read a map and compass, and many more interesting topics. More importantly, students who graduate from the course learn that hunting is about being part of the outdoor experience, observing wildlife in the wild, and connecting with the natural world. As most ethical hunters will tell you—it's more about the outdoor experience than what you bring home for dinner.



I would like to close by offering the following guidelines for this spring gobbler hunting season that will not only make your trip afield safer, but will offer you valuable knowledge that could save your life.

1. Because a gobbler's head is distinguished by its bold white, blue and red colors, NEVER wear white, blue or red clothing - not even socks or undershirts.
2. Turkey hunters should wear blaze orange when walking to and from their calling positions and when setting up or moving decoys. Wearing blaze orange is always recommended; however, if you choose not to wear blaze orange, then tie a sash of blaze orange to a nearby tree to alert others of your presence.
3. Choose a calling position that will provide you with a backstop as wide as your shoulders and will protect you from the top of your head down. A large tree is best.
4. When choosing a calling position, select one with a good view of your surroundings and where the sun does not distort what you are seeing.
5. Never shoot at a sound or movement. Wait until you have a good, clean shot at a legal bird.
6. Never move, wave or make turkey sounds to alert another hunter of your presence. Instead, call out in a loud voice and remain hidden, until the other hunter acknowledges your presence.
7. Never stalk a turkey. Another hunter could be behind that gobbler and those decoys.
8. When you get a gobbler, carry him out of the woods draped in blaze orange.

Mission Statement

To manage Virginia's wildlife and inland fish to maintain optimum populations of all species to serve the needs of the Commonwealth; to provide opportunity for all to enjoy wildlife, inland fish, boating and related outdoor recreation; to promote safety for persons and property in connection with boating, hunting and fishing.

Dedicated to the Conservation of Virginia's Wildlife and Natural Resources

Commonwealth of Virginia
Timothy M. Kaine, Governor

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Nittany Valley Offset, State College, PA.

Virginia Wildlife (ISSN 0042 6792) is published monthly by the Virginia Department of Game and Inland Fisheries. Send all subscription orders and address changes to *Virginia Wildlife*, P. O. Box 7477, Red Oak, Iowa 51591-0477. Address all other communications concerning this publication to *Virginia Wildlife*, P. O. Box 11104, 4010 West Broad Street, Richmond, Virginia 23230-1104. Subscription rates are \$12.95 for one year, \$23.95 for two years; \$2.00 per each back issue, subject to availability. Out-of-country rate is \$24.95 for one year and must be paid in U.S. funds. No refunds for amounts less than \$5.00. To subscribe, call toll-free (800) 710-9369. Postmaster: Please send all address changes to *Virginia Wildlife*, P.O. Box 7477, Red Oak, Iowa 51591-0477. Postage for periodicals paid at Richmond, Virginia and additional entry offices.

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About the cover:
During the 2005 spring gobbler season hunters reported harvesting 14,355 birds. East and west of the Blue Ridge Mountains changed little from spring of 2004. The harvest of 8,779 gobblers in counties east

of the Blue Ridge decreased only 1% over last year's harvest of 8,864 birds. West of the Blue Ridge Mountains, the harvest of 5,576 gobblers was 2% higher than last year (5,474). Despite some inclement weather conditions around the state during last year's Youth Day a total of 196 gobblers were harvested; this was up slightly from 191 birds in 2004. photo © John R. Ford

**VIRGINIA
WILDLIFE**

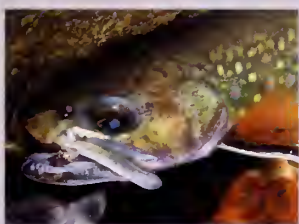
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The Circle Remains Unbroken



The story of Virginia's shad migration continues to be an upstream battle.

by Tee Clarkson
photos ©Dwight Dyke

There is something unmistakably comforting about the cycles of nature that make us feel whole, that make us feel connected again to the way things work, to the way they have always worked. If you allow yourself, you can feel the pulse of the earth spinning on its axis, the rush of survival as hickory and American shad pile into our rivers every spring by the thousands. One on top another, sliding back and forth and in-between each other in the current, these fish battle their way hundreds of miles upstream to where they will spawn.

Directly above me, where I-95 bridges the James River, the world is rushing. The daily mad dash to Ashland, Petersburg, D.C. Perhaps we're not so unlike these fish as we would like to think. Funneling into traffic, pushing forward, always forward.

A couple false casts and let it go, quartering upstream and across the current, let it sink, mend, let it sink, let it sink, okay, strip, strip, strip, bang! Again my 6-weight is almost yanked out of my hand as an American shad thumps hard against the current 40 feet below the boat. After several minutes the fish reluctantly surrenders to my hand. Just a quick pop of the fly

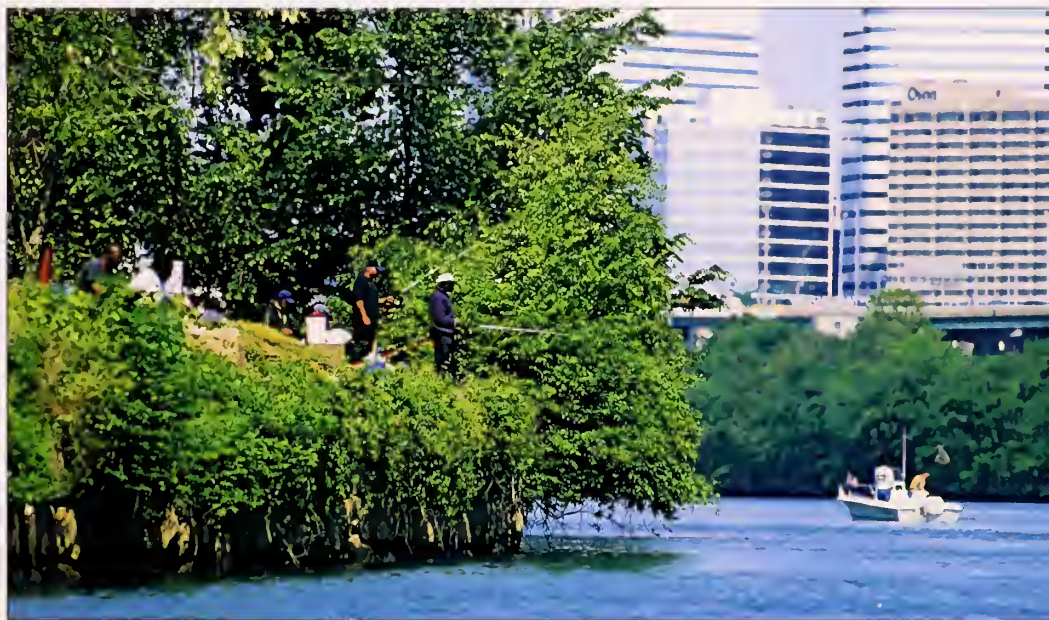
and she is back on her way to the spawning grounds. Odds are though she wasn't born here in the James.

In response to an overall decline of American shad in the early 1990s due to over harvesting, pollution and a loss of spawning habitat, the American Shad Restoration Program was initiated in Virginia in 1992, following the lead of Maryland and Pennsylvania. With The Department of Game and Inland Fisheries acting as the lead agency, the restoration has been a massive group effort. Help has come from a broad source of interests including: the City of Richmond, The James River Association, The Virginia Marine Resources Commission, The Virginia Institute of Marine Science, The U.S. Fish and Wildlife Service, The Association of Independent Watermen, Virginia Commonwealth University, The Chesapeake Bay Program, Fly Fishers of Virginia, the Fish Foundation and Coastal Zone Management, as well as the Pamunkey and Mattaponi Indian tribes whose ancestors relied on these fish for survival thousands of years before the arrival of European settlers.

Through the efforts of these organizations, the American shad have made a substantial comeback. Begin-



roken





ning in 1995, when the first hatchery-raised fish began returning to spawn, the percentage of hatchery fish captured has steadily declined from 90 percent to 70 percent. "These numbers are an indication that the program is working," says Tom Gunter who coordinates the state's restoration program for The Department of Game and Inland Fisheries.

As this American shad disappears back into the James, I can only speculate how long and strange her trip has been to this point. More than likely this shad's life story reads something like this: Her mother was caught in a net in the Pamunkey River, where the eggs were immediately fertilized and shipped to either the King and Queen Fish Hatchery or Harrison Lake National Fish Hatchery. There, the eggs were kept in a hatching jar for 4 to 11 days, depending on water temperature, until she emerged, wiggling her way through the protective sac of a nearly microscopic egg and swimming up a tube and into a holding tank. Several days later the entire tank, loaded on a truck by volunteers

and seasonal employees, was shipped to the James River, where she and 500,000 other fry were released at dusk into these cool flowing waters. If this in fact is the story of her journey, then only roughly 1 in every 400 of the fry released that day have survived to adulthood and returned to the river to spawn. This fish has defied the odds.

Just a few more miles and she will be past the rapids formed at the fall line in downtown Richmond. The fish stack up here, resting and waiting to make their way upstream into the rushing waters. Through Hollywood Rapids, over the fish ladder at Boshers' Dam, some of them continue upstream as far as Powhatan and beyond, over 100 miles from the ocean.

The spring runs of shad and herring once led to fishing villages here on the banks of the James, where native peoples scooped fish from these same waters with woven nets, smoking them over fires along the river by the thousands. When the European settlers arrived, they stopped here as well, their boats too big to continue



©Spike Knuth



upstream. The migration of the shad helped them survive lean times and created a lucrative business in the years to follow.

"This is the wheel of history returning on itself. Two hundred, three hundred, four hundred years ago, the native people camped right here. There were fishing villages on the banks of the river and on Belle Isle in downtown Richmond," Ralph White, the overseer of the James River Park System, explained to a group of on-lookers at the James River Fish Festival in May of 2005. "The species remains the same and the festive sense remains the same," he continued. Ralph was one of the founding fathers of the fish festival that has celebrated the return of the shad and the health of the James River for the last two years.

The James River Fish Festival is not the only celebration marking the shads' return. The Shad Rodeo, formed five years ago by Cheairs Porter, Rob Caudle and Matt King, has celebrated the restoration of the shad in the James River in a somewhat different way. This tournament, which has averaged 40-45 entrants the last several years, raised over \$5000 dollars for The Young Supporters Group of the Virginia Performing Arts Foundation in 2005. Before that, the tournament raised money for Freedom House Homeless Shelter

Since 1995, fisheries biologists have been taking and hatching shad eggs in the spring and releasing the fry back into Virginia's tidal rivers. Since that time the James River has received 84.8 million, Pamunkey 24.9 million, Rappahannock 7.8 million and the Potomac 1.3 million, totaling 118.8 million shad.



While hatchery raised shad still make up the majority of returning adults to Virginia's tidal rivers a good percentage of natural spawning is now occurring, which is a good sign that recovery efforts are working. In recent years biologists have documented the natural spawning of shad upstream of Boshers Dam and downstream of the fall line. Illustration ©Spike Knuth



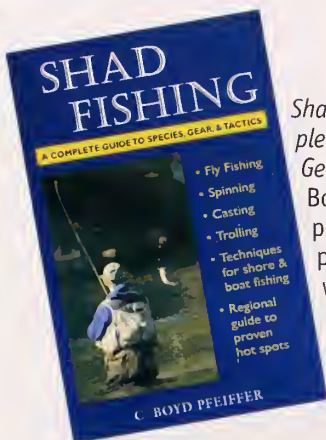
and the Historic Richmond Foundation. The tournament winner is determined by the cumulative length of five fish, based on the honor system since all fish are released, but winning the tournament is not first on the list of most competitors, many don't even measure their fish. "It's just cool to think that someone is getting a new musical instrument or a hot meal because of the shad," Cheairs says.

After releasing this fish to continue on her journey, I stand and check my fly before making another cast. I am literally surrounded. Boats to my left, my right, upstream, and down, cars zooming past above me. This must be what it is like when you find yourself in the middle of the school swimming upstream.

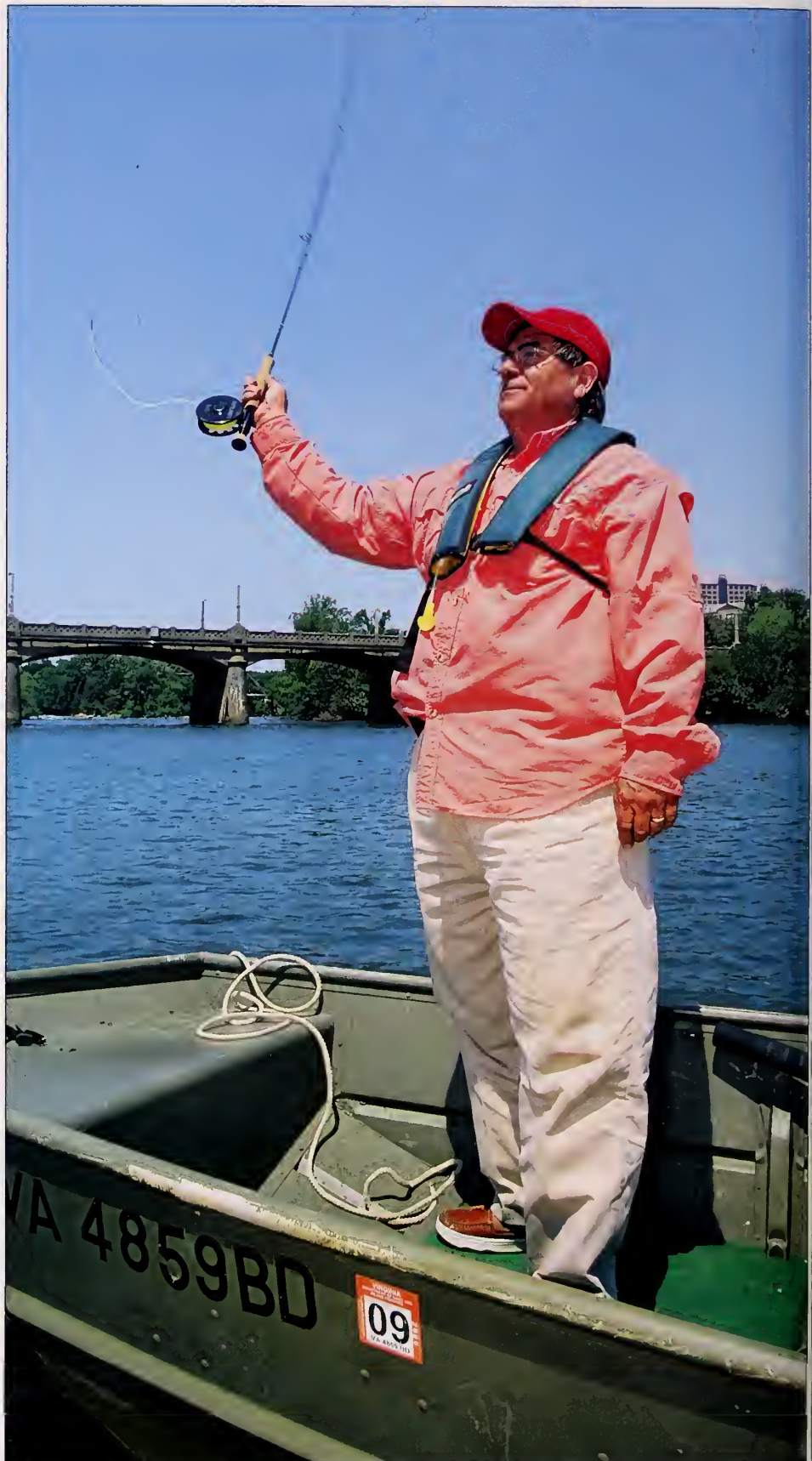
With some luck that particular fish will make it to spawn, and with even more luck, her fry will survive and make the journey downstream past this spot, past Williamsburg, into the Chesapeake Bay, then out into the open ocean for four or five years, before returning. Swimming again right past where I am anchored on their way to the same spawning grounds where they were born. With some luck, I will be here too. □

Tee Clarkson is an English teacher and in his spare time runs Virginia Fishing Adventures, a fishing camp for kids. For more information you can contact Tee at: tsclarkson@virginiafishingadventures.com.

For more information on The Shad Rodeo, email questions to: shadrodeo@hotmail.com



Shad Fishing: A Complete Guide To Species, Gear, & Tactics, by C. Boyd Pfeiffer and published by Stackpole Books offers a wealth of angling information.



American shad are still under a strict harvest moratorium (recreational and commercial) and it is illegal to harvest them. Please check the current fishing regulations regarding Virginia's shad fisheries.



2nd Annual James River Fish Festival

by Tee Clarkson
photos ©Dwight Dyke

Rattling along the old cobblestone street in downtown Richmond on a Saturday morning last April, one can't help but be reminded of what life used to be like here. The old tobacco warehouses have been converted to loft apartments, fish houses turned to office spaces, and the open air markets, that would have been bouncing with life a hundred years ago, have surrendered to the new malls 15 miles from here in the suburbs.



Mike Kendrick, a 22-year-old biology major at VCU, points out what lives under the rocks in the James River.

Today, however, people have come, not to reminisce about a past they can't remember, or change for that matter, but to acknowledge a rebirth they can witness right before their eyes, the rebirth of the James River. The Second Annual James River Fish Festival, made possible by a conglomerate of organizations and volunteers from the Richmond Department of Parks, Recreation and Community Facilities to the Department of Game and Inland Fisheries to the Biology Department at Virginia Commonwealth University, is a celebration of all the work that has been done in order to revitalize the entire James River watershed.

This is also a celebration of the annual shad migration. In the spring, both hickory and American shad pile into the James by the tens of thousands, heading back to the same gravel bars where they were born only a few years earlier. In the 1970s the river had become so choked with sediment and pollutants that the shad, which



Participants of last year's James River Fish Festival admiring a hickory shad just caught from the James River.



Shad make their way upstream through the breaches in Manchester, Brown's and Belle Isle dams, up through the notch in William's Island Dam and ultimately through the vertical slot fishway at Boshers Dam.

once migrated up the James in such great numbers that people literally scooped them out of the water with nets, had all but quit coming. Thanks to millions of dollars in sewer upgrades, the breaching of dams, the construction of fish ladders and a concerted joint stocking effort by the U.S. Fish and Wildlife Service and the Virginia Department of Game and In-



land Fisheries the fish have now returned.

Crossing the 14th Street Bridge, fishermen line the railings, their rods leaning in a row: one, two, even three a piece sometimes. Behind them, boats are already anchored in the river, hoping to cut off a few fish on their way to the spawning grounds. The city is beginning to breathe. On the sidewalk two fish statutes, welded from scrap metal, stand 5 feet apart and just about as tall, marking the entrance to the festival.

Beside an aquarium filled with warmouth perch, bluespotted sunfish, dragonfly larva, crayfish, stoneflies and blueheaded chubs, all of which can be found in the James River watershed, Mike Kendrick, a 22-year-old Biology major at VCU points out each species to a crowd of interested adults and excited children. Kneeling over a cooler filled with a thousand larval shad donated by the Harrison Lake National Fish Hatchery in Charles City, Anne Wright, the Coor-



A dancer from the Pine Camp Arts and Community Center reads up on what she can do to make the James River cleaner.



ordinator of Education and Outreach for the Life Sciences Department at VCU, explains to a group of onlookers that a female American shad will lay anywhere from 400,000 to 600,000 eggs a year. Amber Foster, James River Watershed Coordinator for the Virginia Department of Conservation and Recreation, outlines the new Tributary Strategies designed to reduce nitrogen and phosphorous run-off from agriculture, construction and forestry practices. These are just a handful of people that go to work everyday for the James River.

The idea for The James River Fish Festival first came up during a conversation between the manager of The James River Park System, Ralph White, and Greg Garmon who works with the VCU Biology Department. At a water testing conference three years ago they got to talking about all the progress that had been made toward the health of the James over the past several decades. Frustrated by the fact that too much emphasis was put on failures and future projects, they decided to throw a party to cele-



Left: Anne Wright, VCU Coordinator of Education and Outreach for Life Sciences, and several young bystanders (above) release a bag of thousands of American shad larvae from the Harrison Lake National Fish Hatchery into the James. Below: A nice hickory shad from the James caught at the Fish Festival.



brate the successes in the restoration of the James River.

Winding up the ramps leading to the lookout platform above the 14th Street Bridge, Ralph expands on the motives behind the festival, "We want to restore a sense of celebration of the river. There are kids inventing fish down there. We have photography, painting, art and science. We're working on a second or third level of fish appreciation, of water appreciation." His love of the river is evident in his excited tone.

From the top of the platform the world opens up. The James tumbles over rocks, between boulders, where cormorants dive in the riffles, emerging with thick wiggling throats, blue herons stab at fry in the shallows. Behind them the city silently keeps watch over its most precious resource. This place is as old as mankind. For as long as we have been here, man has foraged on these banks.

Below, Anne Wright leads a group of young kids to the water with plastic bags full of shad larvae to be released



Above: Dale Huggins, from the Orvis store at Short Pump Mall, points out some effective flies for shad to an interested bystander. Below: Anne Wright loads up another bag of larval American shad to be released into the James. The 3rd Annual James River Fish Festival will be held Saturday, April 22, 2006, along the south side of the 14th Street Bridge, in Richmond.



into the river. A young boy in a yellow shirt empties his bag and looks up at Lynn Spurlin, a volunteer from The Virginia Anglers Club, who hands him a fishing rod with a shad on the end of the line. All of a sudden the boy is in a tussle. He's pulling and reeling, trying to get a handle on the fight. Lynn leans over and helps him raise the rod a little, then it's up to the boy again. Yanking and reeling he stumbles back a few steps and the shad finally comes bouncing out of the water on the rocks where he is quickly scooped up by Lynn. Both look at each other and smile.

Up the bank a little, Rick Browder, from the Department of Environmental Quality, leans against a boat and explains how they shock fish from the river in order to collect tissue samples which will be analyzed for contaminants. Ralph's voice brings us back: "This is a celebration of art and science", he says, smiling, ambling quickly away to point out a peregrine falcon nesting under the bridge to a couple with a telescope.

Heading back down the ramp we're greeted halfway by a group of dancers from Pine Camp Arts and Community Center. Dressed in bright, sparkling outfits the young boys and girls have taken on the appearance of a shad, fresh from the ocean. They slither and spin, jump and shake their way around a clapping crowd. This is the dance of the shad migration. Back down the ramp they go then turn upstream, bounding and moving, sliding and chasing each other into an imaginary current, moving always toward their final destination, where they stop, and one is raised above the ground and the eggs shaken from her body.

The crowd applauds. A slight rain begins to fall. A fitting end to a celebration of water. □

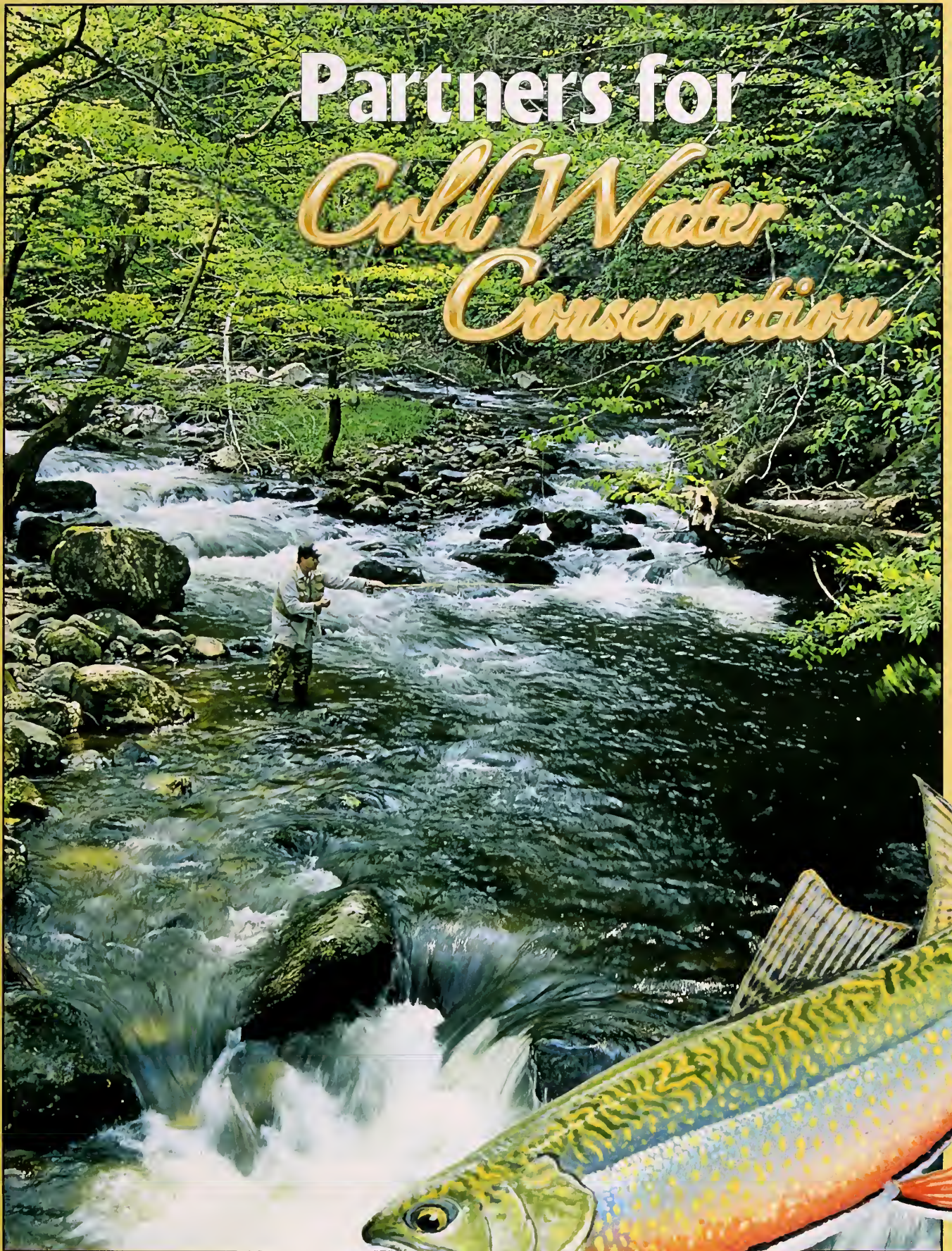
Tee Clarkson is an English teacher and in his spare time runs Virginia Fishing Adventures, a fishing camp for kids. For more information you can contact Tee at: tsclarkson@virginiafishingadventures.com.



Above: A young angler picks up a rod and tries his luck for shad during the Fish Festival. Below: Dancers from the City Dance Camp at the Pine Camp Arts and Community Center perform an interpretive dance of the life cycle of a shad from the ocean until they spawn in the James River.



Partners for *Cold Water Conservation*



©Spike Knuth

Battle for the Brook Trout

Virginia's State Fish

by John Ross

It could have been the largemouth bass. Plenty of those in the Commonwealth and they're plenty popular among anglers. Ditto with the smallmouth; fishing for them on the upper New and James rivers is unparalleled. Might even have been the shad, so important it was in the diets of Virginia first citizens.

Writing in the *Richmond Times-Dispatch*, outdoor columnist Henry Christner, reported naming the brook trout as Virginia's state fish "just sort of happened."

"Del. W. Roscoe Reynolds of Martinsville, who isn't a fisherman, said he introduced the brook trout bill because he was urged to do so by the Virginia Council of Trout Unlimited.

"There wasn't much debate or discussion about the pros and cons, partly because of the tremendous load of legislation to be dealt with in this year's (1993) short session.

"The vote in favor of the brook trout was 88-8 in the House of Delegates and 37-2 in the Senate, and Reynolds said the 'no' votes came not from backers of other species but from legislators who didn't think we needed a state fish."

Governor Douglas Wilder signed the bill. "It goes well with the cardinal and the dogwood tree," opined Henry.

Virginia has more miles of Appalachian mountain brook trout water—about 1800—than any other state in the country. The fish, itself, is a beauty.

The brook trout is formally known as *Salvelinus fontinalis*. *Salvelinus* is an old name for the genus of char, and *fontinalis* comes from the Latin "living in springs."

Perhaps that's why the brook trout is so important to Virginia. It's a symbol, an icon, for clean water and clean air which are of such vital importance to the health of the residents of the Commonwealth.

The smog that chokes our cities, even smaller ones west of the Blue Ridge, is born of the same pollutants that produce acid rain. Acid rain, its siblings of acid snow and acid fog, and its cousin—dry acidic particles that we cannot see or feel—is the most severe threat to Virginia's healthy populations of mountain brook trout.

Maps produced by the Eastern Brook Trout

Joint Venture, based on data compiled by Mark Hudy of the U. S. Forest Service from survey work completed by the Virginia Department of Game and Inland Fisheries, National Park Service, and the Forest Service, show that outdated farming practices have led to the loss of more brook trout habitat in Virginia than any other cause.

If you don't believe this, talk with Urbie Nash of Waynesboro, who'll tell you about the huge 4 pound wild brook trout that once inhabited the headwaters of Mossy Creek.

Drive the back roads of the counties of the Shenandoah Valley, of high and beautifully isolated Burkes Garden down in Tazewell County, and those as well that thread along the base of the eastern foothills of the Blue Ridge mountains. For millennia, those streams held brook trout. No more.

Deforesting of stream-side acreage removed shade from the streams and caused summertime water temperatures to rise above that which brook trout could tolerate. Old ways of tilling fields for crops filled streams with sediment that smothered gravel beds where brook trout once laid their eggs.

And when grazing replaced cropping as agriculture's mainstay, livestock entered streams wherever they could. Breaking down banks widened streams and slowed their flows which speeded even more the warming of their waters, to say nothing adding yet more sediment. Pollutants from poultry farms present the newest threat to what were once fine brook trout streams.

Suspended sediments and high levels of nitrogen from fertilizers and waste not only jeopardize the quality of spring creeks, but the loads they carry are flushed into the rivers that foul the Chesapeake Bay.

In Shenandoah National Park the issues are similar yet different. With axe and hoe, hardy mountain families scratched their livings from shallow soils. Hunting and fishing augmented meager diets. Timber was king among legal cash crops, but logging led to increases in stream sedimentation and temperatures. Some streams became barren. But a massive campaign from 1937 into 1949 reversed the trend and populations of brook trout were re-established. Today, Shenandoah National Park holds many of the state's best brook trout streams.

Trout Unlimited's "Back the Brookie" program is a metaphor for a broad drive to address air

and water pollution as well as a campaign to protect wild brook trout where they still exist and re-establish them where it makes sense. The introduction of rainbow and brown trout, which have replaced brookies in many of the state's cold waters, in many cases cannot and should not be reversed. Relatively few Virginia streams, with waters cold enough to sustain brook trout, contain natural barriers like high waterfalls which would separate them from more aggressive rainbows and browns.

But there are some locations, such as the headwaters of the Smith Creek in Augusta County and the uppermost reach of Red Bud Run near Winchester, where trout do not generally exist and which boast enough cold water flow to give wild brookies a chance. In other locales such as Grayson Highlands State Park wild brook and rainbow trout share the same streams. There, acid deposition appears to threaten both species and the rainbows more than the brook trout because 'bows are not as acid-tolerant as brookies. These are representative of the types of streams which are the focus of Back the Brookie conservation efforts.

"Good, serviceable symbols aren't that easy to find," Henry wrote, and that's one more reason why he liked the choice of brookies as the state fish. Here he made a perfect cast.

In addition to its conservation initiatives, Back the Brookie is a campaign to help Virginians learn more about what we can each do to reduce pollution and improve air and water quality. Throughout the year, volunteers from Trout Unlimited will be speaking to community and school groups about the state's fish as a symbol for clean air and cold water. A team of middle school teachers, with the assistance of staff from the Virginia Department of Education, is developing acid rain education materials to be used in middle schools in an effort to foster a new generation of air and water quality conservationists.

Trout Unlimited is forging new partnerships with leading energy producers—Dominion and Appalachian Power—so that each better understands the inter-relationship among the imperatives that residents and businesses in the Commonwealth have access to affordable electricity, healthy air, clean water and the economic and recreational benefits of high quality angling for trout. □



©Dwight Dyke

Back the Brookie

by Marcia Woolman

With the identification of the southern Appalachian brook trout as a distinct strain of *Salvelinus fontinalis*—the brook trout native to the eastern United States, Trout Unlimited councils in North Carolina, Tennessee, Georgia and South Carolina conceived a campaign—Back the Brookie—to raise public awareness about the need to preserve and restore the fish to its native habitat.

Because the brook trout is Virginia's state fish and the fact that the southern brook trout's native range extended as far north as the New River, the Virginia Council of Trout Unlimited joined Back the Brookie in 2003.

About the same time, fisheries biologists from Georgia to Maine were discussing the continual loss of brook trout, how to keep from losing any additional habitat, and the potential to restore some that had been lost from their historical range. In June 2004, 15 state agencies, 4 federal agencies, 5 universities and 6 non-government organizations met in Shepherdstown,

West Virginia, to discuss the decline of the Eastern brook trout.

At this meeting the attendees agreed to enter a partnership modeled after the nation's very successful National Waterfowl Management Plan. This partnership, the Eastern Brook Trout Joint Venture, is the first pilot project of the new National Fish Habitat Initiative (fishhabitat.org).

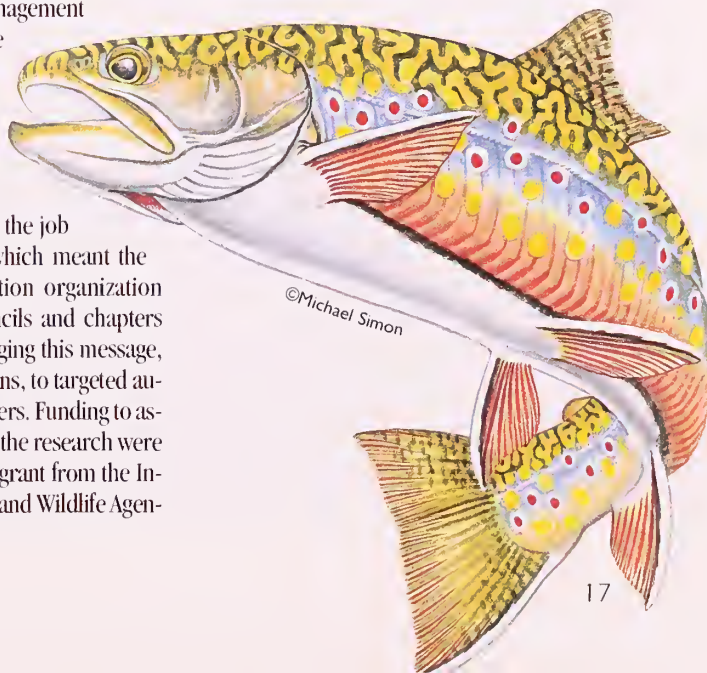
Trout Unlimited was given the job of outreach and education, which meant the national coldwater conservation organization and its network of state councils and chapters would be responsible for bringing this message, the "call to action" and solutions, to targeted audiences and public policy makers. Funding to assist with this and other parts of the research were obtained through a \$680,000 grant from the International Association of Fish and Wildlife Agencies (iafwa.org).

Back the Brookie became the education and outreach component of the Eastern Brook Trout Joint Venture. As state and federal fisheries biologists and other scientists began gathering data documenting the extent of brook trout populations, habitat and threats, Trout Unlimited was organizing a network of grass roots leaders to increase public understanding of the importance of the brook trout as an indicator species for air and water quality.

In Virginia, with funding from Dominion Virginia Power, Trout Unlimited completed *Battle for the Brookie*, a video depicting the impacts of acid rain on the state fish and on the health of residents of the Commonwealth. A grant from the Virginia Environment Endowment is funding the development of acid rain curriculum for use in the state's sixth grade classrooms, the first time that environmental education appears in Virginia's Standards of Learning. These initiatives by Trout Unlimited have prompted other states to begin similar projects.

This spring, Trout Unlimited will release a major report from the fisheries scientists describing how brook trout are doing in 11,400 subwatersheds from Georgia to Maine. State by state, the report will show with maps the extent and status of brook trout. State and federal agencies working with TU and other conservation and community organizations will use this report to identify priorities and solutions for the restoration of brookies. Implementation will be the second phase of the Eastern Brook Trout Joint Venture.

National TU staff along with TU volunteers, state and federal agencies, and others will hit the "media trail" with this message: "Brook trout are bio-indicators of healthy watersheds and good water quality, which is important to good health." The campaign will target elected officials, civic organizations, business and industry, and conservation groups. □





Where Brookies Are, And Aren't

by Nat Gillespie

In cooperation with biologist Larry Mohn and his colleagues with the Virginia Department of Game and Inland Fisheries, a team of scientists led by Mark Hudy, of the U.S. Forest Service and James Madison University, has developed an extremely detailed and comprehensive portrait of the presence of brook trout in the state.

In close collaboration with the staff of Trout Unlimited's national office and the U. S. Geological Survey, Hudy created an electronic database that catalogs the status of brook trout in 392 subwatersheds, each about the size of a 7.5-minute topographic map, which range from suburban Northern Virginia west to the northern tip of the state and then southwestward following the great valley and the mountains that bound it to the point where the state meets Tennessee and Kentucky at Cumberland Gap.

Virginia's map is just one of 17 Hudy developed for each state participating in the Eastern Brook Trout Joint Venture, a union of state and federal fisheries agencies, businesses and foundations, and Trout Unlimited and other conservation organizations, committed to protecting, restoring, and enhancing the habitat of the only

salmonoid native to much of the East—the brook trout.

The brook trout population study is based on the classification of subwatersheds that represent the drainage area of several streams. Working with state and federal data, the assessment team classified each individual subwatershed into 1 of 7 categories based on quantitative scientific data for wild, reproducing brook trout.

For example, if 90 percent of the total stream miles in a subwatershed that historically contained wild, self-reproducing brook trout still support wild, self-reproducing brook trout, the subwatershed was classified as intact. If brook trout were known to be present in any part of a subwatershed, but no scientific population assessment, such as electroshocking had been performed in the past 10 years, it was classified as qualitative presence. If brook trout were known not to exist in the subwatershed, but it was unclear whether they had vanished or if they never historically lived there, the population was classified as absent.

According to Hudy's analysis, the Commonwealth of Virginia retains the strongest brook trout populations south of the Mason-Dixon

Line. For tens of thousands of years brook trout have thrived in Virginia's mountains. Brook trout demand the coldest and cleanest water, and act as a gauge of the health of the stream and the entire land area that forms its watershed.

Strong brook trout populations indicate that the stream and landscape around is healthy and that the water quality is exceptional. Reduced or missing brook trout populations tell us that the ecosystem is off-balance and more often that water quality has been compromised.

About 30 percent (116 of 392) of the subwatersheds studied in Virginia contain intact (36) or reduced (80) populations of wild brook trout. These populations are concentrated in steep mountain streams protected by the Shenandoah National Park and the George Washington and Thomas Jefferson National Forests.

Despite this relatively strong reservoir, Virginia has lost all historical brook trout populations in about 38 percent of its subwatersheds, an area nearly the size of Connecticut. Brook trout no longer live along a contiguous swath of land stretching from Winchester south through the Shenandoah Valley and continuing south of Roanoke into southwestern Virginia. Brook trout across this area once inhabited valley bottom spring creeks, such as Mossy, Red Bud Run, and Smith Creek, that over time have become degraded by warmer water temperatures, excessive nutrients, and sedimentation.

In northern Virginia, it is unclear whether brook trout vanished years ago or if they, indeed, ever historically occurred in these streams. Yet, given their nearness to areas where brook trout were known to have existed and others which contain reduced or intact populations, it's likely that they are extirpated—once present, but are now gone.

While acid rain constitutes the primary threat to intact populations of brook trout, historic land management—clearing of forests for cropland, tilling of fields and grazing of livestock—have contributed to the eradication of brook trout from subwatersheds where they are no longer present.

Virginia's fisheries experts also ranked turbidity, pesticides and eutrophication among the top 10 most widespread impacts on brook trout. These impacts are associated with out-of-date farming practices, roads and residential development. Road and culvert fragmentation—creation of barriers to brook trout—of streams are problematic statewide, attributable to both suburban development and forestry.

With the exception of basalt among the rocks of Shenandoah National Park, the geology

of much of the Appalachian Mountains lacks the capacity to buffer acid rain. Regional biologists identified 76 subwatersheds, or about 20 percent of those studied, as being adversely impacted by acid rain. While not as widespread as other impacts, acid rain harms a significant portion of remaining brook trout habitat and threatens many intact populations found in sensitive, high elevation areas.

Among the 17 states in the Eastern Brook Trout Joint Venture, Virginia has gathered the most complete picture of its brook trout. The data comes from nearly 30 years of field work by Department fisheries personnel and hundreds of interviews with landowners and others who know the history of the fish in the subwatersheds. In addition, other data were gathered from the U.S. Forest Service and the National Park Service. As stream monitoring continues and new brook trout population data becomes available, fisheries managers will be able to update the database and the maps.

Interested groups and individuals will be able to electronically access the assessment results for Virginia through the Eastern Brook Trout Joint Venture. The U. S. Geological Survey Web site will ultimately house all of the data collected and will provide online users with an interactive Web site to view and download different layers of information. For those interested in more in-depth analysis, the U. S. Forest Service will make the scientific assessment report and the entire GIS database available upon request.

Hudy's analysis is the first step in a collaborative process to improve brook trout habitat and water quality and return one of the country's most beautiful gamefish to more of its home waters. Virginia's waters represent the finest concentration of intact brookie populations in the entire Southeast.

The brook trout's tenacity and ability to survive, coupled with Virginia's vast mountain landscape and enlightened natural resource management are to be credited for the persistence of this Virginia native. The collective efforts of Virginians to restore the brook trout and its uncompromising demand for excellent water quality can play a key role in the larger effort to heal the headwaters of the Chesapeake Bay, protect our drinking water supplies, and improve the quality

All of the subwatershed classifications are listed below.

Brook Trout Classifications	Total	%
Intact (>90% habitat occupied)	36	9.2%
Reduced (50-90% habitat occupied)	80	20.4%
Greatly Reduced (<50% occupied)	56	14.3%
Extirpated	148	37.8%
Present, Qualitative Data Only	8	2.0%
Unknown, No Data	0	0.0%
Absent, Unknown History	64	16.3%

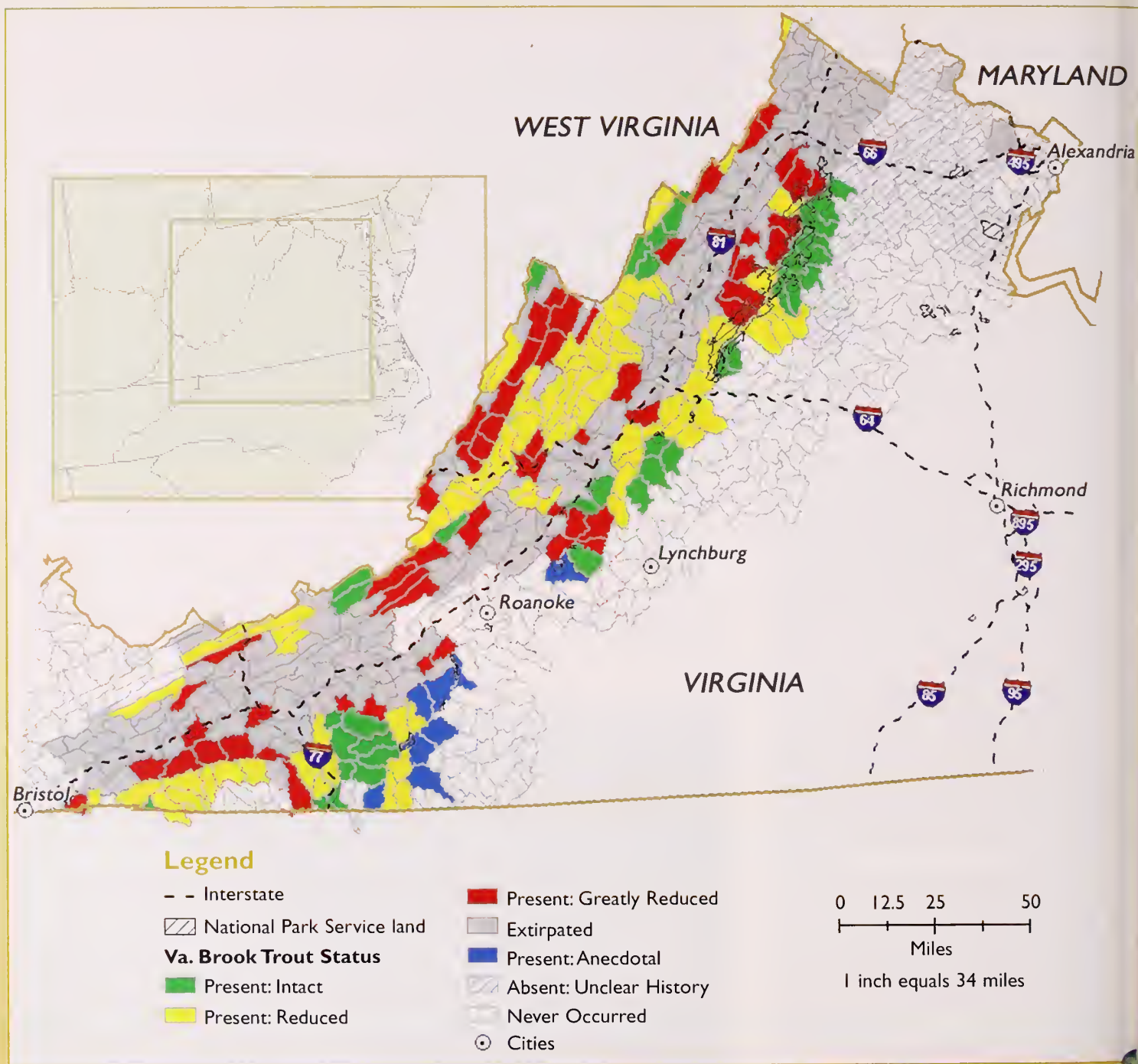
Impact (Severe or Medium)	# of subwatersheds	% of subwatersheds
High Water Temps.	253	77.1%
Agriculture	214	65.2%
Riparian Habitat	209	63.7%
Grazing	205	62.5%
Road/culvert fragmentation	198	60.4%
Turbidity	188	57.3%
Eutrophication	148	45.1%
Pesticides	101	30.7%
Instream Habitat	80	24.4%
Road Sediment	66	20.1%

USNPS and VDGIF conduct electro-shocking on Moorman's Run to determine the extent of wild brookies.



Lee Walker

Virginia Brook Trout Population Status by Subwatershed

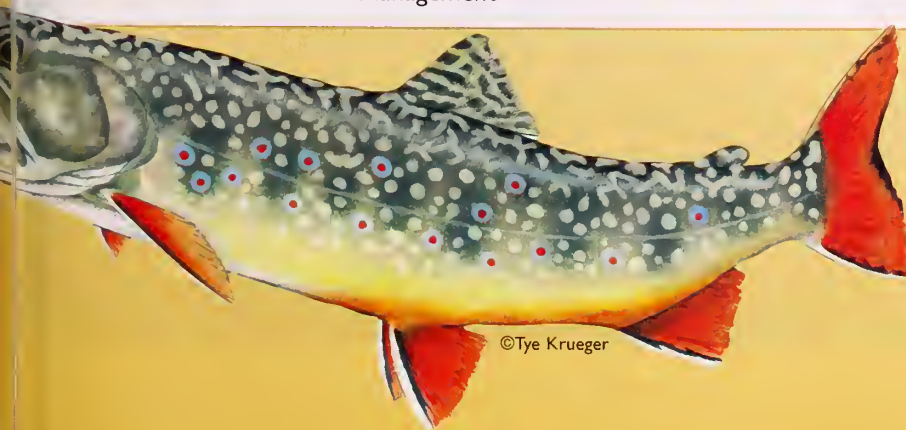
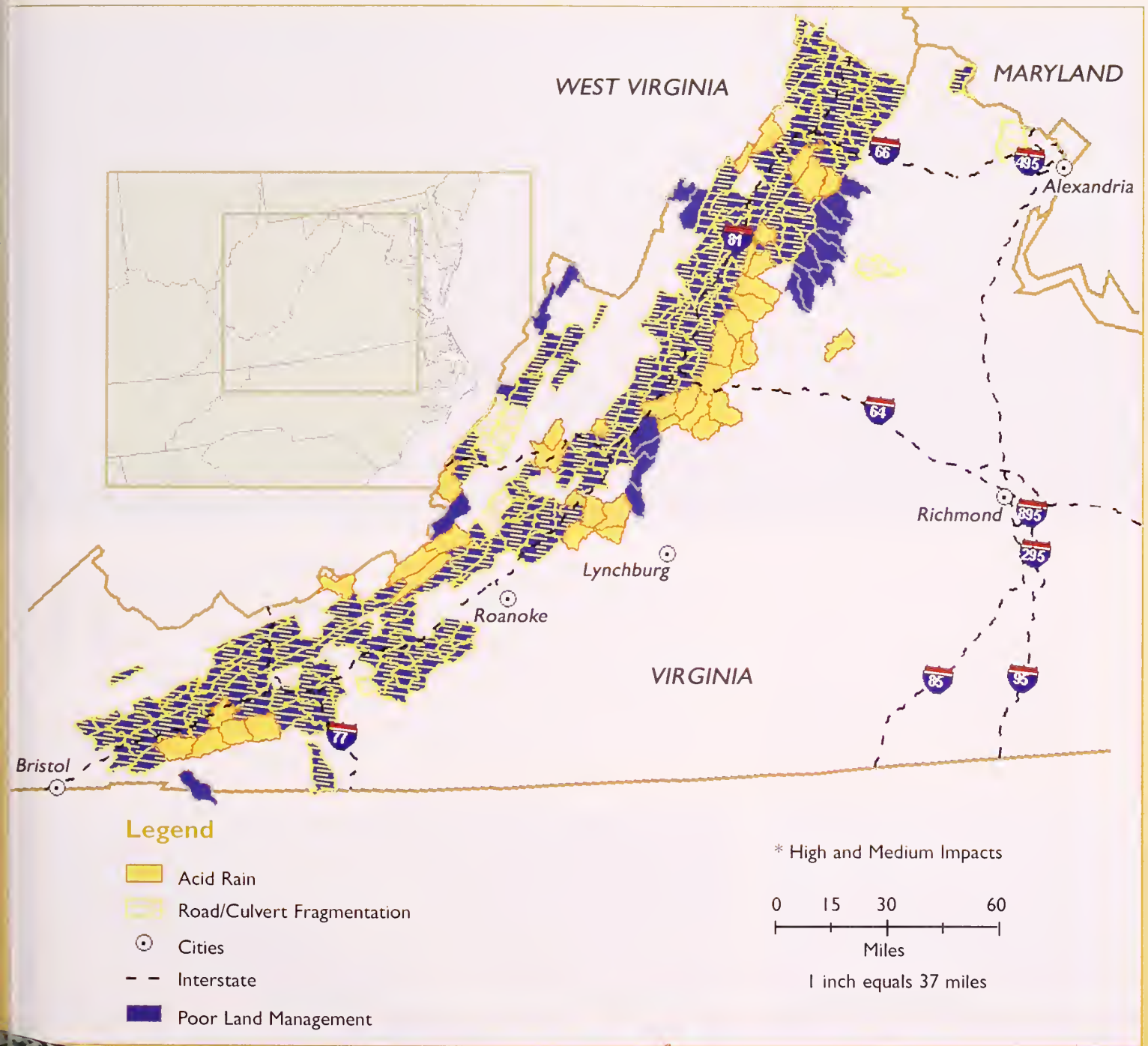


Draft assessment of brook trout status, 12/12/05 by Nathaniel Gillespie, Trout Unlimited.
Map created from data found in, "Distribution, Status and Trends of Brook Trout in the Eastern United States, 2005" by Mark Hudy, USFS, Teresa Thieling, USFS and James Madison University, Nathaniel Gillespie, TU, and Eric Smith, USGS.



©Tye Krueger

Impacts from Acid Rain, Road/Culvert Fragmentation, and Poor Land Management on Brook Trout Waters



Grayson Highlands: A Unique Mountain Trout Lab



by Larry Puckett

Among Virginia's wild places, few are more fascinating—and offer better angling for wild brook and rainbow trout—than Grayson Highlands State Park. Sitting north of U.S. Rt. 58 midway between Damascus and Galax, the park's 4,822 acres range from about 3,700 to over 5,000 feet in elevation. It is the highest of Virginia's major state parks, and as such it contains relict boreal forest similar to those found in central eastern Canada.

The height of the park's rounded mountains makes it more likely that moisture carried by passing weather fronts will condense and deposit acid rain, fog or snow. Unfortunately, bedrock here is rhyolite which is a form of tightly compressed volcanic ash. Unlike the limestone that floors many of Virginia's valleys, rhyolite is highly resistant to weathering.

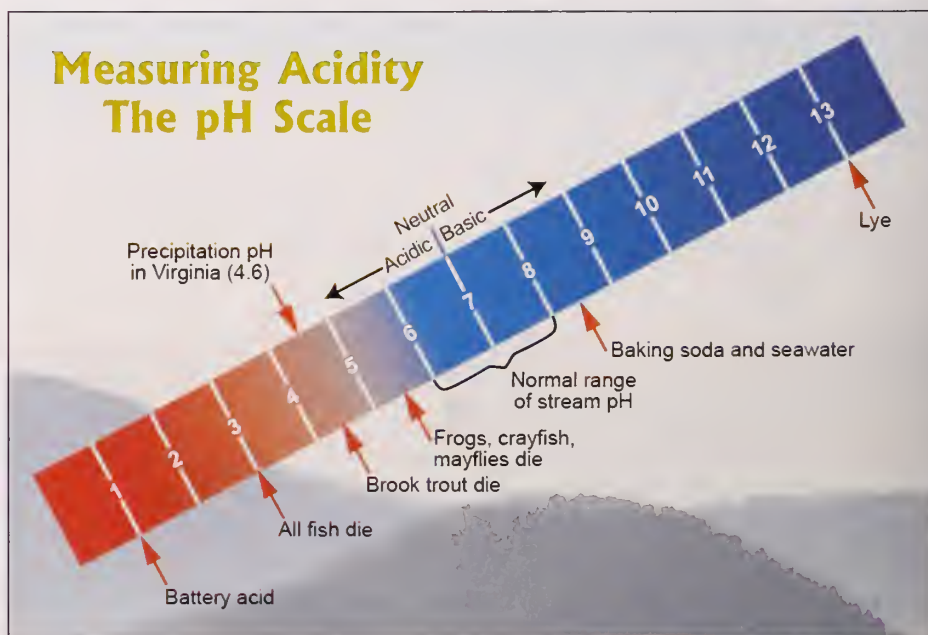
Stream acidity is measured by the pH scale. When stream acidity falls below 4.5pH, brook trout begin to die.

Unlike other volcanic rock such as basalt, rhyolite contains few minerals that buffer airborne acid depositions. There's no forgiving geological formation, as you find in much of Shenandoah National Park, to protect Grayson Highland's watersheds from high acidity and the decline in aquatic life it causes.

A pH of 7.0 is considered neutral and a pH of 3.0 is close to household vinegar. On Grayson Highlands, the annual average pH of precipita-

tion measures 4.6. Over the past 30 years, stream pH in the park has decreased from a normal range of about 6.3-7.8 in 1978 to 5.0-5.5 today. A year ago, the pH of spring runoff in the park measured as low as 3.95. If such levels persist, the park's famed populations of wild brook and rainbow trout may not survive.

To better understand the cycles of acidic deposition and their impacts on Grayson Highland's nearly 15 miles of wild trout water, Trout Unlimit-





ed and Grayson Highlands State Park have formed a broad partnership. In cooperation with VDGIF, the Department of Conservation and Recreation, the University of Virginia, the U. S. Forest Service and the U. S. Fish and Wildlife Service, a multi-year project has been conceived that will intensively measure the chemistry of streams and populations of insects and fish in them.

Also under study is the genetic make-up of the wild brook trout in the park. The native

Above: Dawn Kirk, fisheries biologist with the USFS, looks for aquatic insects on North Creek, site of a TU project. Below right: Partnership among USFS, VDGIF, Dominion, and TU led to the second liming of the St. Mary's ensuring it remains one of Virginia's best trout streams.

species should be the Southern Appalachian brook trout found from the New River south to northern Georgia. But the stocking of brookies before the early 1990s, when the Southern Appalachian strain was confirmed, may well have introduced other genetic strains of brook trout. One goal of the research is to determine whether any pockets of pure Southern Appalachian brook trout exist within the park, and if so, how they might best be conserved.

After a year's sampling, the combined agencies will have a better understanding of how acid deposition is affecting wild brook and rainbow trout. Knowledge gleaned from the study will identify streams where intervention, such as liming on the St. Mary's, may be needed to preserve healthy trout populations until air pollution levels abate.

As well as conducting water quality research, the partnership will be installing kiosks, to be placed at trail heads leading to Big Wilson Creek and Cabin Creek, that describe the fragility of the park's human and natural setting and threats to wild brooks and rainbow trout. A lead grant from Appalachian Power, and additional financial support from Churchill Homes in Charlottesville, will enable the construction of the kiosks.

Volunteers are needed for sampling and construction of the information kiosks. To volunteer, contact Grayson Highlands State Park, 829 Grayson Highland Lane, Mouth of Wilson, Va. 24363, phone (276) 579-7092. For more information go to www.vctu.org. ☐





TU Camp

Teenagers interested in coldwater conservation and fishing will be gathering during the last week of June at Graves Mountain Lodge in Syria, Virginia, for the annual Trout Unlimited Conservation and Fishing Camp. Graves Lodge is located about a mile from Shenandoah National Park.

During the week-long camp, youngsters will learn about the ecology of mountain streams, about trout, how to fish with fly or spinning tackle, and how to tie flies. Faculty include some of the region's finest fishing guides; scientists from VDGIF, the National Park Service, the U.S. Forest Service, and companies such as Orvis and Angler Environmental; and volunteers from Trout Unlimited.

Each day includes classes in stream hydrology; aquatic life, casting, flytying and features guided fishing trips on the Rose and nearby streams. Campers stay at the lodge and dine with other guests.

"We're fortunate to be able to hold this camp at Graves Mountain," says George Gaines, of the National Capital Chapter of Trout Unlimited and chair of the camp's board of directors. "Not only is the camp setting ideal for teaching kids about trout conservation and fishing, but Jimmy Graves' family has lived in this valley since the 1750s. An

important part of conservation is knowing the history of the land and its people."

Twenty-four campers will be selected from applications which are available on-line. The fee for the camp is \$450 for 2006 and scholarship help is available. Equipment is supplied for campers who do not have their own. The camp staff is supported by trained medical personnel.

The TU Conservation and Fishing Camp is a joint project of the Virginia, Mid-Atlantic and West Virginia Councils and National Capital Chapter of Trout Unlimited. For complete information and an application go to www.tucamp.org. □



Camp Dates

2006—June 25-June 30

2007—June 24-June 29

2008—June 22-June 27





Trout Unlimited in Virginia

Last year has been a tremendous year for trout in Virginia. Fence crossings on Mossy Creek, the state's premiere limestone stream and one of the 100 best in the nation, have been repaired. A new trout-friendly flow regimen on the Smith River, one of our finest tailwaters, has been implemented. The St. Mary's, once so acidic that it was nearly devoid of wild trout, has been re-limed and will remain an excellent fishery for the next five years.

There is more. Virginia TUers filled leading roles in the creation of the TU Conservation and Fishing Camp for high school-aged youth at Graves Mountain Lodge in Syria, Va. A cadre of more than 40 volunteers taught and guided 22 campers in a program that stressed understanding of and responsibility for the natural environment as well as fishing and fly-tying. The camp will be held every year during the last week of June. Our goal is to produce new generations of conservation anglers who will carry on TU's work in preserving Virginia's trout.

Another partnership, this one with Dominion, the Richmond-based energy company, has produced a video describing the impacts of acid rain on trout fisheries in Virginia. Available for use with community groups, the video is the centerpiece of the project to incorporate acid rain education in the curriculums of every middle school in Virginia. A team of middle school science teachers is hard at work writing the curriculum so that it will interface with Virginia's standards of learning.

Plans are also afoot for the Virginia Council of Trout Unlimited to form a coalition including the

Virginia Department of Game and Inland Fisheries, Virginia Department of Environmental Quality, Virginia Department of Conservation Recreation, U.S. Forest Service, U.S. Fish and Wildlife Service, and the University of Virginia to monitor water quality for the purpose of enhancing trout populations in Grayson Highlands State Park. Grayson Highlands is known for its wild brookies and rainbows, but the park's elevations—generally above 4,000 feet—make it unusually vulnerable to acidic deposition. By adopting Grayson Highlands, TU is creating a model program that demonstrates how the synergy of partnership provides an economical answer to trout management based on excellent science and volunteer participation.

For these activities, and a myriad of others, the Virginia Council of Trout Unlimited was the recipient of the Council Excellence award presented by TU at its national conference in September, 2005.

As stewards of more than 2,400 miles of mountain trout water in Virginia enjoyed by more than 150,000 licensed anglers, 4,000 members of VCTU are leading the effort to conserve and protect these important economic and recreational resources.

"I'm often asked why should I join TU," says council chair, John Ross. "I tell them my story, how I joined TU when I moved to Minnesota because I wanted to learn where to fish. Members there asked me to help out on a work day building lunger structures on a stream. I caught a few of the lunkers, and I was hooked."

Currently, TU has 14 active chapters in the state. Two formerly inactive chapters, New River at Blacksburg and Skyline in Lynchburg, are in the process of rejuvenating. TU is very interested

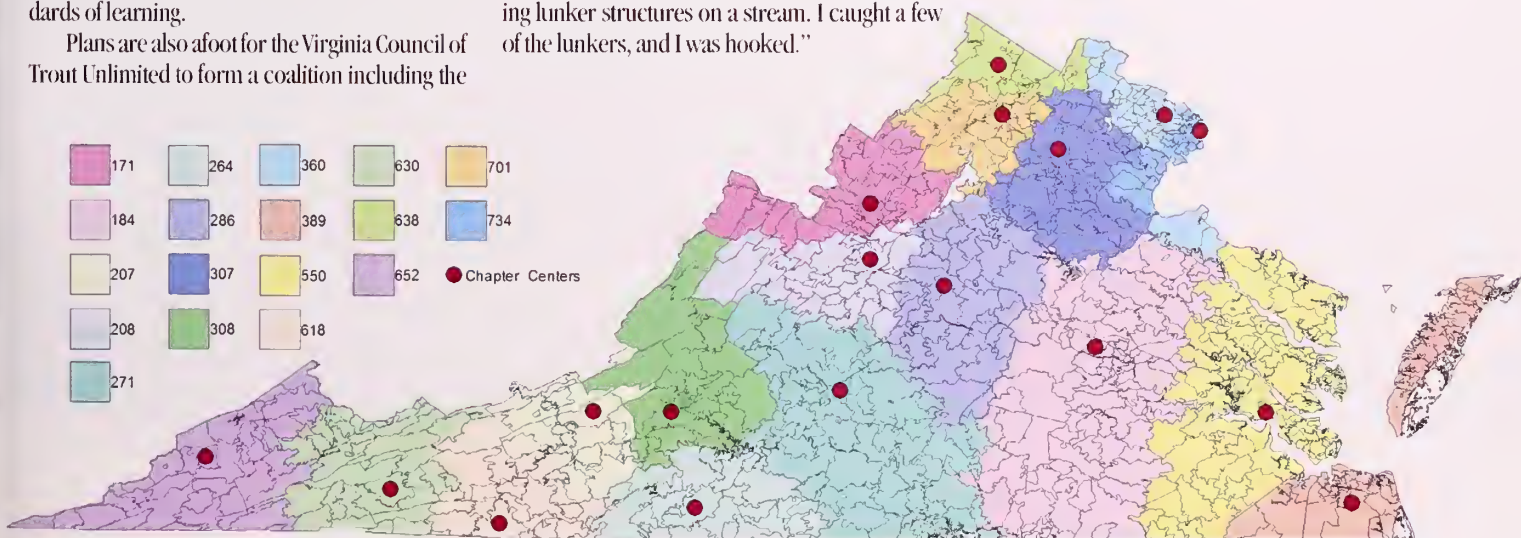


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in developing chapters in such areas as Williamsburg where strong concentrations of members live.

"The purpose of a TU chapter is to serve the interests of members who live in the area," says Ross. "It's the enjoyment of fishing that draws people together, and they find they really enjoy working with kids in youth education programs and helping to protect the streams and the fish they love."

For more information about Trout Unlimited, visit www.vctu.org or the national Web site, www.tu.org.



171 – Massanutten - Harrisonburg
184 – Virginia Capital - Richmond
207 – New River - Blacksburg
208 – Shenandoah Valley - Waynesboro
271 – Skyline - Lynchburg*
264 – Smith River - Martinsville

286 – Thomas Jefferson - Charlottesville
307 – Rapidan - Warrenton
308 – Roanoke - Roanoke
360 – Northern Virginia - Fairfax
389 – Bill Wills - Virginia Beach

550 – Williamsburg - Williamsburg**
618 – Mount Rogers - Galax**
630 – Clinch Mountain - Tazewell**
638 – Winchester - Winchester
652 – Little Stony - Wise
701 – Northern Shenandoah Valley - Front Royal

734 – George Washington - Alexandria

* Rejuvenating
** Inactive



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Partners for Coldwater Conservation in Virginia



dom.com



fs.fed.us



dcr.virginia.gov



nps.gov



dgif.virginia.gov



fws.gov



deq.virginia.gov



appalachianpower.com



vctu.org

The Virginia Council of Trout Unlimited wishes to thank its corporate and governmental partners in the ongoing campaign to conserve, protect and restore Virginia's trout and their watersheds.

Youth Friendly Hunting

Virginia's Youth
Spring Turkey Hunt
is one day out of
the year worth
"gobblin" about.





©Bruce Ingram

by Bruce Ingram

At the banquet for the Virginia Chapter of the National Wild Turkey Federation last February, I offered to donate a hunt in the mountains of Southwest Virginia as part of the fundraising activities. After I had been “auctioned off,” I met the winning bidders, Dr. Bill MacCarty, III and his 12-year-old son Paul, of South Boston. As we discussed plans on when to go afield during the upcoming spring gobbler season, I realized that a perfect time to do so would be on the newly designated “Youth Spring Turkey Hunt” day.

Previous page: Stanley Long strums out some yelps on a box call while he and his dad scan the woods for turkeys. Kids can quickly learn to use calls such as boxes and pushpins. Above: Practicing gun safety is the first lesson that any generation should learn. Paul MacCarty hands his shotgun to his dad Bill, while he crawls through a fence.

That “pre-opener” now occurs the Saturday before the regular spring gobbler season begins, which is always the second Saturday in April. For the former, youth hunters must be 15 years of age or younger to participate. All youth must be accompanied and directly supervised and within sight of an adult. The adult hunter or hunters accompanying the youth must possess a valid Virginia hunting

license (or be exempt from purchasing a hunting license). They also may assist in calling, but they shall not carry or discharge a firearm.

Dave Steffen, research biologist supervisor for the Virginia Department of Game and Inland Fisheries (VDGIF) is a big supporter of the youth opener, a program which began in 2004.

“The youth opener is a marvelous opportunity for an adult to introduce a child to spring gobbler hunting,” says Steffen. “The turkeys have obviously not been pressured, few people will be in the woods the week before the regular opening day, the gobbling is typically very good then, and an adult can totally concentrate on helping a child.

“The youth opener is also a great time for an adult to talk to a child about the special reasons why we hunt. A veteran hunter can take the time to show a child how to read signs, how to identify trees, how to read the terrain—all the little things that make hunting so satisfying.”

Our Youth Day Outing

The evening before last year’s Youth Day, I met with Bill and Paul MacCarty and discussed strategy. Bill is a veteran turkey hunter and Paul already had one spring gobbler to his credit. As we discussed calling options, Paul illustrated how he could



©Bruce Ingram

yelp, cluck and gobble with his voice—something few sportsmen of any age can do. I had spent three days scouting before the youth opener and didn’t have good news to impart. The gobblers and hens were still in large flocks, as winter had been late loosening its grip on Southwest Virginia.

What's more, the weather forecast for the next day called for high winds, thunderstorms, lightning and heavy rain.

Unfortunately, on Saturday morning, the weather forecast proved to be true, and as dawn broke, Bill, Paul and I were parked at the top of a Botsourt County mountain, watching pyrotechnics in the heavens and rain slashing against the windshield. It was then that I suggested that we leave the mountain peak and head for a nearby dairy farm. Perhaps there the birds would come into the fields to forage.

calls. We then decided to move into a forest that borders a long linear field that is about 60 yards wide. This time, we did not espy any turkeys, but two hens answered our supplications on and off for 90 minutes before wandering away.

Next, it was time for another lesson. The precipitation had now stopped, and I told Paul that oftentimes longbeards will erupt into an outburst of gobbling soon after rain ceases and that one particular field edge on the dairy farm is a known gobbler strutting area. I suggested that we head for that edge and set up

cutting hard—a tactic that will sometimes elicit a shock gobble—although it failed on this occasion to draw a response. And at the noon closing time, we saw a large flock of toms and hens foraging in a field some 150 yards away—no doubt the same gobblers that had ignored the same hens and us that only sporadically returned our calls.

As we were returning to the vehicle, we came to a fence. I saw Paul make sure that the shotgun's safety was still off and then hand the gun to Bill, as the youngster was preparing to cross the fence. Firearm safety is ob-



Above and left: Creeks are excellent locations to search for turkey signs, such as turkey droppings. During the Youth Day and other early season days, turkeys will often move to creeks and springs to look for aquatic foods, as well as vegetation along the banks. Right: Patience may be the hardest part of turkey hunting.

there. Earlier, I had showed the young man the popcorn-like droppings of a hen—a lesson on sign identification, as well as proof that birds were using that general area.

Once again, though, these turkeys were apparently blissfully unaware of what they should be doing, and no gobblers appeared to strut before us—although hens continued to answer our calls. Paul and I even tried

viously one lesson that Paul has already learned quite well.

After School Hunting for Youth

Another child friendly initiative that the VDGIF started in 2004 was allowing afternoon spring gobbler hunting the last two weeks of the season.

"Those two weeks when afternoon hunting is allowed is a wonderful opportunity for high school and college students to go afield," says Steffen. "A student now won't have to cut, say, first period English if he wants to spring gobbler hunt, as he can now go after school. Hunting pressure is typically way down that

Just a few minutes after we left the vehicle, Paul spotted several hens and a gobbler meandering across a field. Bill and Paul set up next to each other while I positioned myself behind them. From a distance, I observed as Bill pointed out to Paul likely travel paths of the birds to our locale and also which trees the young man could expect a tom's head to disappear behind—at which time Paul could mount his shotgun. The Youth Day is a superb time for veterans to instruct novices in areas such as these, and I watched as Paul nodded his head in acknowledgement at what his dad was trying to communicate.

The turkeys, however, showed no interest in coming toward us—the driving rain perhaps muffling our

late in the season, so the older youths who go on their own, or the younger ones that go with adults, should have the woods pretty much to themselves."

Afternoon spring gobbler hunting is obviously still quite new to the Old Dominion, so Steffen, who has experience in Mississippi and other states that have long allowed all-day hunting, offers these do's and don'ts.

- ◆ Don't expect to hear as much gobbling, but do expect toms to come in silently more often than in the morning.
- ◆ Do go to areas where you heard toms earlier in the season. They will likely still be there.
- ◆ Do set up between feeding and roosting areas. Call sparingly—give a few soft yelps and clucks every 20 to 30 minutes.
- ◆ Don't do a great deal of walking and calling. Odds are that you will spook more birds than you call in.
- ◆ Do build a blind.
- ◆ Do stay until sunset. By doing so, you will have a good chance to roost birds for the next morning.

Afternoon Hunting with Youngsters

I was able to go on several afternoon hunts with budding hunters during the 2005 season and found these outings marvelous opportunities to teach young people about the spring woods. For example, on one venture I went afield with Fincastle's Stan Long and his 10-year-old son Stanley. We had been hunting the same patch of Botetourt County woods for several weeks, and that was, in fact, how I had met the Longs. So we decided to triple team a gang of three gobblers that had been outwitting us.

One evening, I remarked to the younger Long that I had heard over 30 species of songbirds while hunting the property. Stanley immediately wanted to know how to identify bird songs, and I explained to the young-



©Bruce Ingram

This year's Youth Spring Turkey Hunt is Saturday, April 1, 2006. Hunting times are one-half hour before sunrise to 12:00 noon. Youth hunters must be 15 years of age or younger to participate. Youth hunters between the age of 12 and 15 must have appropriate valid hunting licenses. Hunters under the age of 12 are not required to have a license, but they must be accompanied by a licensed adult. All youth must be accompanied and directly supervised and within sight of an adult. Adult hunters accompanying youth must possess a valid Virginia hunting license (or be exempt from purchasing a hunting license); may assist with calling; and shall not carry or discharge a firearm.

ster that one way to do so was to put the songs into words. A towhee's tune, I explained, could be rendered "drink your teaaaaaa." Before long, Stanley was able to identify several more species on his own.

I also showed Stanley how to make gobbler yelps, as the trio of toms was not at all responsive to our hen talk. The use of gobbler yelps, which are slower, deeper and harsher in sound than hen yelps, is an underutilized tactic, and the youngster—in one evening—was able to create realistic gobbler yelps on a slate call. Stanley was so good at doing so, in fact, that he became the designated caller that evening while his dad and I scanned the woods and listened to the band of brothers repeatedly answer the youngster's yelps with yelps and gobbles of their own.

I was also able to go spring gobbler hunting one evening with Roanoke's Mike McDaniel and his 15-year-old daughter Katelyn. She explained what after school hunting meant to her.

"I just like the opportunity to spend time with my dad," said Katelyn, who has killed four whitetails during her brief hunting career. "We can't talk while we're hunting, because you have to be quiet when you're after turkeys. But on the way home, we can talk about the day's hunt, school, family, the future, college."

Mike McDaniel has also become a fan of evenings afield.

"I like the opportunity to go hunting with any of my kids," he told me. "There aren't any distractions when we're in the spring woods. And Katelyn's right about how special the drives home are. It's a great time to share what's on our minds."

Youth Day and afternoon hunting are both marvelous innovations from the Virginia Department of Game and Inland Fisheries. This spring, don't miss the opportunity to share these times afield with members of your family or neighborhood youngsters.

Bruce Ingram is the author of three books: The James River Guide, The New River Guide and The Shenandoah/Rappahannock Rivers Guide. For more information, contact Ingram at be_ingram@juno.com or Ecopress (800-326-9272) or www.ecopress.com.



Top: The author and his son Mark, a student at Longwood University, admire a fine spring gobbler. Above: Hunting guides can also be an excellent way to get to know an area and pick up some useful hunting tips. In the case of 10-year-old Robert Andrews it was just what he needed to help him take his first turkey. Thanks to guide Mark Pope, from Southampton County Outfitters, Robert and his dad experienced a day during the Youth Spring Turkey Hunt that they will cherish for a lifetime.

What A

The parasitic sea lamprey, one of the earliest exotic species accidentally introduced into the United States, is finding its way into Virginia's waterways.

by Emily Brown

This story takes place on a beautiful spring morning in the middle of May. We decided to take a four-wheeler ride to Cunningham Creek, which runs across the back of our farm in Fluvanna County. After briefly enjoying the sunshine and fresh air by the waters edge, we spotted an odd creature lying under a rocky ledge. It had a sucker-like head with an eel-like tail. We knew it was not like anything we had seen around here before. Excited by the finding, we decided to return home for a



Sucker!

bucket and a net. After careful planning, we managed to catch the weird looking creature. It was neither a fish nor an eel. Measuring over 2 feet long and showing a mouth full of teeth, we knew it was not your every day catch. After a closer examination, we noticed that it had seven breathe holes on each side of its body, a blow-hole on top of its head, and two separate dorsal fins. We brought it home and started to do a little research to find out what this creature could be. After a book and Internet search, we believed that it was a sea lamprey, but we couldn't understand how or why it had come this far.

We managed to contact a wildlife biologist with the Virginia Department of Game and Inland Fisheries. He confirmed that it was indeed a sea lamprey. He further explained that within the last few years, the Game Department opened dams and other obstructions in rivers and creeks which lead to the ocean, allowing species like this lamprey to travel further into small tributaries like Cunningham Creek. Although sea lampreys have been documented in this

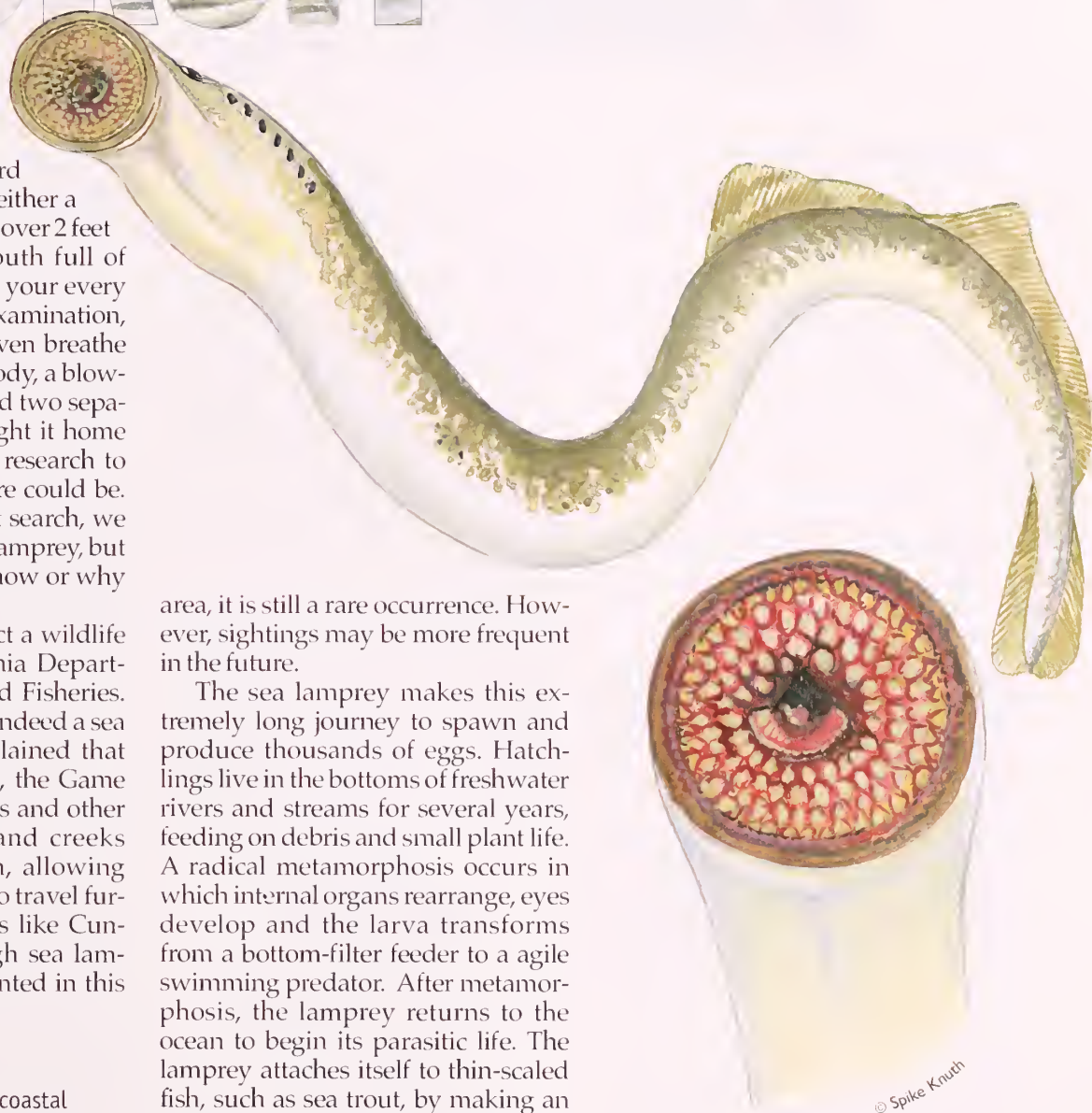
The sea lamprey, native to coastal Virginia, feeds by locking onto a host fish and then sucks its body fluids by using its teeth and a grasping tongue.

area, it is still a rare occurrence. However, sightings may be more frequent in the future.

The sea lamprey makes this extremely long journey to spawn and produce thousands of eggs. Hatchlings live in the bottoms of freshwater rivers and streams for several years, feeding on debris and small plant life. A radical metamorphosis occurs in which internal organs rearrange, eyes develop and the larva transforms from a bottom-filter feeder to a agile swimming predator. After metamorphosis, the lamprey returns to the ocean to begin its parasitic life. The lamprey attaches itself to thin-scaled fish, such as sea trout, by making an incision with its tongue, which has razor like teeth. Once the incision is made, the lamprey begins to suck the blood and bodily fluids of the "host" fish. A lamprey may kill as much as 40 pounds of fish during its five to eight year parasitic stage. Most of the "host" fish will perish, only about one in six will survive. During the lamprey's last 12 to 20 months of life, it returns to freshwater to spawn. Once the adults have completed their breeding cycle, the lamprey dies.

Satisfied with our research and after taking photos of this amazing pre-historic creature, we returned it back to the creek to complete its humble mission. □

Emily Broten is a 26-year old, life-long resident of Fluvanna County and an avid outdoors woman who loves to hunt and fish in Virginia.





Game Warden Recruitment

The Department of Game and Inland Fisheries is accepting applications for Game Warden, Law Enforcement Officer II. A completed state application for employment and a cover letter must be received no later than 5:00 p.m., Monday, May 1, 2006. For more information call (804) 367-1000 or visit the Department's Web site at www.dgif.virginia.gov. □

Occoquan NWR Generation Deer Hunting Workshop.

Game Warden David Dodson



The Virginia Department of Game and Inland Fisheries, in partnership with the Occoquan Bay National Wildlife Refuge, conducted a deer hunting workshop for youth hunters on December 3, 2005. The hunters, who were each accompanied by an adult, attended a two-hour classroom session on deer biology, hunting techniques, hunting ethics and safety. They were then allowed to participate in an afternoon hunt at the National Wildlife Refuge. The hunters drew from among 22 different elevated stands, each designed to hold two people. The maximum allowed shooting range was 30 yards, and was marked around the stands. They were on their stands only a few minutes when the calls started coming in

over the radio, "I got a deer here on stand 9," and "We have a doe at stand 11." Twelve of the 21 hunters were able to harvest a deer, and for many of them it was their first. Jason Rohrer, of Bealeton, was very excited, repeating, "That's my deer over there!" Caroline Nepomuceno, of Beaverdam, was the winner of a lifetime hunting license donated by Safari Club International. In addition to controlling the deer population on the Refuge, the workshop introduced young people to an outdoor activity that they can enjoy for a lifetime.

On the following Monday, December 5, 2005, a similar workshop was held at Occoquan Bay NWR for adult novice hunters. Designed for beginners, the participants were extremely enthusiastic. Even in the midst of a snowstorm, six of the 14 hunters were successful at harvesting a deer. □



by Beth Hester

Woman the Hunter
by Mary Zeiss Stange
1997, Beacon Press
Boston
ISBN: 0-8070-4639-6

"I find myself hard-pressed to discern a time when I was not a hunter. Such is the process of self-discovery. We spend a lifetime learning to become what we in some sense have already, always, been."

- Mary Zeiss Stange

Part cultural history, part anthropology, part personal reflection,

Woman the Hunter is a refreshing and compelling exploration of women's involvement in hunting. Mary Zeiss Stange, long-time hunter and Professor of Religion and Women's Studies at Skidmore College, was fascinated by the increasing numbers of women engaged in hunting, as well as the fact that women are more likely than men to have taken up hunting as adults rather than as children.

These statistics led her to explore some of the assumptions associated with gender, culture and hunting. She is particularly wise in noting that historically, the personal perceptions of two completely divergent subgroups of men and women: the male "macho" hunter, and the well meaning, but wrongheaded eco-feminist, have *both* played roles in reinforcing negative and often inaccurate stereotypes of woman's relationship with wilderness and hunting.

Each thought-provoking chapter is prefaced with vivid accounts of her own hunts for elk, deer and antelope, and she reflects on some of the hard ethical decisions she was compelled to make while in the field. *Woman the Hunter* is scholarly without being dry, and will reward the earnest reader many times over.

The Southern Plantations Cook
by Leslie Delaney and David McKim
1999, Saint Simons Publishing
ISBN: 0-9671690-1-1

As a collector of cookbooks, I am always on the lookout for new volumes to add to my shelves. If the cookbooks also contain recipes for wild game, then that's an added bonus. *The Southern Plantations Cook* takes you on an alphabetical tour of eleven major southern plantations. From Barton Ridge Plantation in the foothills of the Appalachian Mountains, to Wynfield Plantation in south-

west Georgia, every chapter featuring the food, hospitality and history particular to each locale.

Here are just four examples of the savory recipes included in this well-illustrated volume:

- Brownie Honey and Maple Syrup Cheesecake with Peanut Brittle Sauce
- Grilled Quail with Smoked Gouda Grits and Tomato Gravy
- Mooney's Sour Cream Cornbread
- Sesame and Peanut-Crusted Soft Shell Crab

There are recipes for both fish and fowl, so you can cook your way through the chapters all through the year.

Information on each plantation is provided, including location maps, contact numbers and summaries of the types of hunts and outdoor activities available to guests. With *The Southern Plantations Cook* as your guide, you'll be itching to plan your next road trip.

Nongame Tax Checkoff Program

Celebrate the 25th Anniversary of Virginia's Nongame Wildlife Program by helping to support essential research and management of Virginia's native birds, fish and other nongame animals.

If you are due a tax refund from the Commonwealth of Virginia, you can contribute to the Virginia Nongame Wildlife Program by simply marking the appropriate place on this year's tax checkoff, on the Virginia State Income Tax Form.

If you would like to make a cash donation directly to the Virginia Nongame Wildlife Program using a VISA or MasterCard, you can visit the Department's Web site for more information or mail a check made out to: Virginia Nongame Program and mail it to Virginia Nongame Program, 4010 W. Broad St., Richmond, VA 23230-1104.

Remember, that this is your chance to help with the management of Virginia's wildlife.

Fishin With The Pros Program

by Barb Franz

During the month of June 2005, The Challenged Sports Exchange (CSE), a special needs recreational and athletic program under The City of Lynchburg Parks & Recreation Department, joined forces with local professional bass fisherman Dave Dudley, from Green Meadow Farm in Lynchburg, Virginia. Special needs participants, both male and female, age 5 and up, were given the chance to fish on three different evenings during June. For some this experience was the first time they had ever held a fishing pole in their hands or caught a fish.

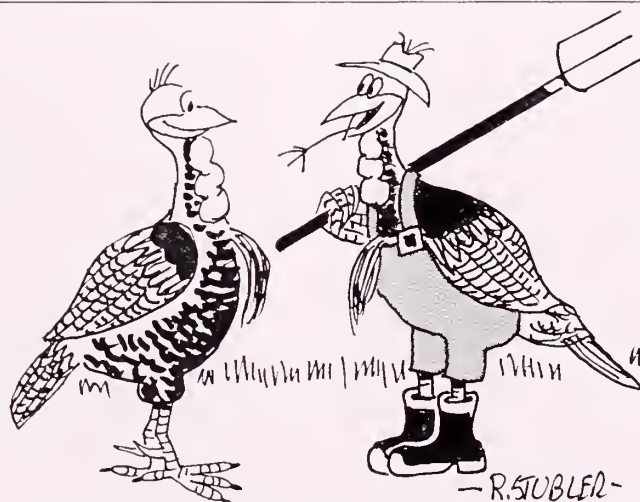
Approximately 40 local bass fishermen, three local game wardens and 30 special needs individuals spent three Tuesday evenings getting to know each other, making new friends and trying their best to out fish the person next to them. Each evening volunteer "Buddies" were matched to a special needs individual. Most choose to keep their original "Buddy" each night they came out to fish. Participants scanned the shoreline for the optimum fishing spot and staked their claim each night. Blake Davis, the youngest participant of the group and a first time fisherman, managed to catch the largest fish during the entire program.

Green Meadows Farm has a 1½-

acre lake privately owned by fishing pro Dave Dudley. The catch and release pond is open to the public nine months of the year and stocked with bass, crappie, perch and catfish. The only condition for entry is that the adult fisherman must bring a child.

A family potluck and awards ceremony was held the fourth Tuesday evening at the Moose Lodge 1727 Family Center. All special needs individuals were awarded with a trophy sporting a picture of them with one of their prize catches that was caught during the program. Jerry Skinner and Ray Armes passed out fishing hats as Castrol Pro Dave Dudley presented each with a rod and reel as a remembrance of the month long program.

The CSE Advisory Committee worked with Castrol Pro Dave Dudley and the bass fishermen to set up this first time program. The Challenged Sports Exchange was so popular that it will once again be offered to special needs individuals in the Central Virginia region June 6, 13, 20 & 27, 2006. An awards potluck is scheduled for Thursday, June 29th. For more information on how you may help to provide fishing equipment or make financial donations for this program and acquire registration forms please contact Lynchburg Parks & Recreation Department, c/o Barb Franz, C.S.E. Program Coordinator, 301 Grove St., Lynchburg, VA, 24501 or phone 434-455-5880. □



Why, yes, I am a farmland bird, how did you guess?

On The Water

by Jim Crosby

Boat Operators Take On Grave Responsibilities

Not to scare anyone away from the pure pleasures of recreational boating, it must be understood that boat operators take on some grave responsibilities.

Boating laws lay the responsibility for the safety of the vessel and all on-board on the back of the skipper/operator, as well as the safety of all surrounding property and people that are affected by the vessel's operation.

Wow, isn't that a sobering thought! Imagine a fun day on the water turning into a conviction of negligent homicide. It happens. People fall overboard and disappear. Boaters run into each other. Boats explode from trapped gas vapors. Boats run into sunken objects that gore a hole in the hull and sink them. Boaters push heavy wakes into marinas that damage other's boats and even injure people. Boaters speed through anchorages leaving disaster in their wake. Boaters even run over people in the water because they fail to maintain a proper lookout.

This list is certainly not complete but each act could result in the skipper/operator being guilty of grossly negligent operation and could result in some serious damage to ones net worth if not jail time, or both.

What is a person to do to guard against such a calamity? The first step is to recognize that boat operation is different from motor vehicle operation. Before you can legally operate a motor vehicle in Virginia, you must study the laws, safe operation, safety considerations and demonstrate your ability to safely control the vehicle in real life situations as well as pass a test of your knowledge of the subjects covered in the driver's manual.

While not the ultimate answer, that is a giant step toward putting safer drivers on our highways.

To operate a boat in Virginia and many other states, all you have to do is have access to one through purchase, loan or lease. This lack of other requirements puts two kinds of operators out there on the water.

The first group is those who recognize the responsibilities and take steps to educate themselves by learning all the rules, laws and safety procedures.

They sign up to take boating classes, read all the manuals that come with their boat and its equipment and practice good safety procedures. They are the same new operators who will practice boat handling in an area away from other boats, people and obstructions. They take time to learn to operate their boats with due caution for themselves, their passengers and their environment.

That other group of operators is the ones we really have to reach out to with our safety message—the ones who, through either innocence or arrogance, set out to operate their boats without any prior knowledge or training. They represent a hazard to themselves, their passengers and everyone on the water. They put us in the same position as wayward drivers who require us to practice defensive driving.

Defensive boat operation dictates that we must always keep a sharp lookout for anyone or anything that could put our vessel in jeopardy of collision. Even when we know the rules of navigation, we cannot depend on the other operator knowing or abiding by the same rules. We must

always be prepared to take distinctive action to avoid a collision.

The single most frequent cause of boating collisions is labeled "Failure to maintain a proper lookout."

To ensure your vessels safety, it is a good idea to assign lookout responsibilities to everyone onboard. You can't beat having someone watching your back when so much responsibility lies thereon. I always spell it out to eliminate confusion by pointing to a particular person and saying, "Please watch our stern and alert me to anyone approaching or overtaking us from that direction." This appointed lookout is extremely important when you are towing a skier, a tow toy or maybe even a disabled vessel as a Good Samaritan. If you have enough people onboard, assign one to each side of the vessel as well. Of course, the helmsman (operator) has the overall responsibility but primarily the forward lookout duty.

When underway, a smart operator will maintain a safety zone all around the vessel into which they will avoid any unexpected intrusion. That zone should include other vessels, obstructions, high bottoms in low water, docks, piers, bridge abutments, riprap, shorelines or anything that could wreck havoc upon the vessel and its passengers.

I challenge all of you in the first group to promote boating safety classes to members of the second group—particularly the innocent ones! We can make a difference. All we have to do is to keep promoting and practicing boating safety by words, actions and deeds. □

RECIPES

by Joan Cone

Springtime is Shad Time

Spring is when shad ascend our coastal rivers to spawn in fresh water. These days only hickory shad are legal. The larger American shad are available still from out-of-state sources. There is also a herring run at about the same time. Both shad and herring roe are delicious.

Menu

*Broiled Shad or
Sautéed Shad and Herring Roe
Cheesy Broccoli Bake
Pineapple Raisin Salad
Apple Butter Pound Cake*

Broiled Shad

2 pounds shad fillets, fresh or frozen
1/4 cup butter or margarine, melted
2 tablespoons horseradish
2 tablespoons lemon juice
2 teaspoons prepared mustard
Salt and pepper to taste
Paprika

Thaw fillets if frozen. Cut into serving-size portions. Combine remaining ingredients except paprika. Place fish, skin side up, on a well-greased broiler pan. Brush with sauce. Broil about 3 inches from source of heat for 4 to 5 minutes. Turn carefully and brush with sauce. Broil 4 to 5 minutes longer or until fish flakes easily when tested with a fork. Sprinkle with paprika. Makes 6 servings.

Sautéed Shad and Herring Roe

Fry enough bacon allowing one or two pieces per person. Leave just enough fat in fry pan to cover bottom. Dust roe lightly and gently with flour. Place roe in hot bacon fat and brown well. Turn, using a spatula, and brown on the other side and then allow to cook until eggs appear done. Allow one small pair of roe or one half of large pair per person. Herring roe is much smaller and takes less cooking time.

Cheesy Broccoli Bake

Filling

1 package (10 ounces) chopped broccoli, cooked and drained

3 tablespoons butter or margarine
2 tablespoons flour
Salt to taste
Dash cayenne pepper
1/2 cup milk
1 cup (4 ounces) shredded cheddar cheese

Dough

1 tablespoon milk
1 tablespoon oil
1 egg
1 cup plus 2 tablespoons buttermilk
pancake mix
Paprika

Heat oven to 350° F. Grease a 1-quart casserole. In medium saucepan, melt butter, stir in flour, salt and pepper until no longer lumpy. Add milk all at once. Cook until thickened, stirring constantly, about 1 minute. Add cheese and broccoli, stir and set aside. Lightly spoon pancake mix into measuring cup; level off. In small bowl, beat milk, oil and egg. Add pancake mix and stir until blended. Dough should form ball. If too moist, add 1 to 2 teaspoons pancake mix. If too crumbly, add 1 to 2 teaspoons milk. With greased fingers, pat dough evenly in bottom and up sides of prepared pan. Pour broccoli-cheese mixture over dough. Sprinkle with paprika. Bake at 350° F. for 25 to 30 minutes. Makes 6 servings.

Pineapple Raisin Salad

1 can (20 ounces) pineapple chunks in its own juice
1/4 cup vegetable oil
1/4 cup white wine vinegar
1 tablespoon Dijon mustard
1 tablespoon honey
1/2 medium green apple sliced
1/3 cup raisins
1/3 cup walnut halves, toasted (optional)
6 cups torn lettuce

Drain pineapple, reserving 1/4 cup juice. Combine reserved juice, oil, vinegar, mustard and honey. Combine remaining ingredients in salad bowl and toss with dressing. Makes 6 servings.

Apple Butter Pound Cake

Cake

1 1/2 cups sugar
1/2 cup margarine, softened
1 package (8 ounces) cream cheese, softened
2 eggs
2 cups flour
1 cup cornmeal
1 teaspoon cinnamon
1/4 teaspoon salt (optional)
1 cup spiced apple butter
1 tablespoon bourbon whiskey (optional)
1 teaspoon vanilla
1 cup chopped pecans

Frosting

1 cup confectioners' sugar
4 to 5 teaspoons milk
1 1/2 teaspoons corn syrup
1/4 teaspoon vanilla or bourbon whiskey

Cake: Preheat oven to 350° F. Grease a 10-inch tube pan or 12-cup bundt pan. In a medium bowl, beat sugar, margarine and cream cheese until light and fluffy. Add eggs, one at a time, mixing well after each addition. In another medium bowl, combine flour, corn meal, cinnamon and salt, if using. In a small bowl, combine apple butter, whiskey, if using, and vanilla. Add flour and apple butter mixtures alternately to cream cheese mixture, mixing at low speed until well blended. Stir in pecans. Spoon batter into prepared pan, spreading evenly to edges. Bake in a 350° F. preheated oven for 60 to 70 minutes or until a wooden pick inserted in center comes out clean. Cool 10 minutes in pan; remove to wire rack and cool completely.

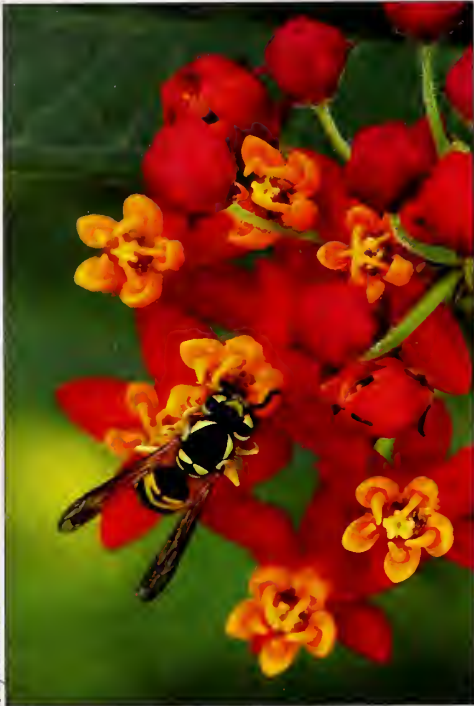
Frosting: In a small bowl, combine confectioners' sugar, milk, corn syrup and vanilla. Drizzle over cooled cake. Store tightly covered. Makes 16 servings. □



Photo Tips

by Lynda Richardson

It's a Digital World



©Lynda Richardson

This close up picture of an eastern yellow jacket is a good example of how advancements in digital technology now make it possible to produce high quality images.

I held my new camera looking it over carefully. Normally, I would be very excited; already planning trips to fun wildlife locations anticipating those first images I would capture. But this was different, way different. This was a DIGITAL camera and it was scary! It looked like my trusty film cameras but it had all these weird features and menus and new things I now had to learn. It was messing with my photographic comfort zone!

It is a digital world out there folks! As you saw in *Virginia Wildlife* magazine's March Photography Showcase issue, most people submitted photographs that were shot digitally; a big change from two years ago. The good news is that digital photography has re-energized people's interest in photography. More folks than ever are

taking pictures and using these photographs in diverse ways.

A big difference between film and digital cameras is that we can now enjoy instant gratification in seeing our images immediately. No more waiting for the film to be processed. But, are we really paying attention to everything that goes along with a digital camera?

With digital photography, you now need a computer to work with your images and keep track of them. If you want to print your own pictures you need a good photographic printer, expensive inks, and specialized paper. You need software programs to work with your images. This list goes on.

With the expanding interest in digital photography, *Virginia Wildlife* magazine has decided to start a monthly column on digital photography. Each month will feature a helpful tip on how you can improve your skills and, hopefully, help you wade

through the digital maze of confusing information. In addition, we thought it would be fun to ask our readers to share some of their successful photographs. These can be film or digitally shot photographs. Our new "Image of the Month," will feature one photographer's image with information about that photograph.

You are invited to submit one to five of your best photographs to "Image of the Month:" *Virginia Wildlife* Magazine, P.O. Box 11104, 4010 West Broad Street, Richmond, VA 23230-1104. Send original slides, high quality prints, or high res jpeg files on disk and include a self addressed, stamped envelope or other shipping method for return. Also, please include any pertinent information regarding how and where you captured the images and what camera and settings you used. We look forward to seeing and sharing your work with the readers of *Virginia Wildlife* magazine! □

Image of the Month



Marcus Holman, of Virginia Beach, captured this eastern hognose snake in the dunes at Back Bay National Wildlife Refuge in October 2005. Canon EOS-1Ds Mark II (digital) camera, Canon EF 70-200mm, f/2.8L IS lens.



Naturally Wild

story and illustration
by Spike Knuth

Common Flicker *Colaptes auratus luteus*

The common flicker, often called the yellow hammer, is our only brownish woodpecker, and the most widely distributed in North America. Flickers used to be separated into yellow-shafted of the eastern U.S., red-shafted of the west, and gilded of the desert regions, but now all are considered "common" flickers. They measure from 11 to 14 inches.

The yellow-shafted variety is found in Virginia. The top of its head is grayish from the forehead to the nape of its neck, with a bright red patch on the back of its head. It sports a longish teardrop-shaped mark on the sides of its throat, and has a black chest patch and large black spots on its breast. In flight it shows its white rump, and golden-yellow under wings and tail.

Its many names reveal its wide distribution and how it was viewed in the past. Many years ago it was treated as a game bird, which is indicated by the names wood pigeon and partridge woodpecker. Other nicknames stem from its calls and habits. Its call is described as "wicka-wicka" or "flicka-flicka," or sometimes a loud "keeow." This is another of the woodpeckers that likes to drum on anything that resonates, like a hollow branch, a rain gutter or a tin roof during courtship as a territorial announcement.

It is a bird of relatively open country, woodlots, orchards, oak groves with relatively sparse understory, and it is common in parks, and residential areas. In the south it may choose pine barrens, palmettos, burned over areas and the wooded edges of swamps.

Flickers nest mainly in tree cavities, seven to 90 feet up, but also in telephone poles, fence posts, occasionally man-made nesting boxes.

Wood chips and down make up most of the nest material; pine straw in pinewoods. They have also been known to carve out a nest hole in log homes, or in other log structures. It was a pair of flickers that excavated nearly 200 holes in the fuel-tank insulation of the space shuttle back in June, 1995, resulting in a launch delay costing over a million dollars. They apparently got just so far until they hit hard metal but kept trying new spots.

Flickers are very prolific egg-layers. A female will continue to lay eggs even if they are removed. In one experiment eggs were removed from a nest each day and the female laid 70 eggs in over 70 days. A normal clutch is six to eight white eggs, which hatch in 11 to 12 days. Both parents assist in feeding. Very young birds are fed regurgitated food at first then fruits and insects until they leave the nest after three weeks.

Ants are one of its prime food sources, and it commonly goes to the ground to dig out and lap up ants. With short hops it looks for ant colonies. It has large salivary glands on each side of its mouth which secrete a sticky mucous that coats its tongue. Inserting its large bill, the tongue can extend as much as 2½ inches into the ant burrow and the ants stick to it. Stumps, logs and leaf mulch are also probed. It eats other insects and insect larvae, as well as a wide variety of wild fruits and berries, and even peanuts left over after harvest.

Flickers fly with a bounding flight style—suddenly swooping upward to land on a tree trunk. This is a bird that loves to take dust baths to rid themselves of parasites. Flickers that nest up

north return to their breeding grounds in late-March. While here in Virginia they will show up in late February, although many flickers winter over in Virginia. At this time you may find them in thicker woods and even in swamps where there is more food and protection. □





Virginia Woods, Waters and Wildlife 2006 Teachers Workshop

The purpose of the workshop is to promote awareness and appreciation of the Chesapeake Bay region's significant living resources by integrating an intensive week of coordinated field activities along the James River, cutting-edge technologies (GPS and GIS), and a graduate-level practicum into meaningful and transferable-watershed experiences.

Workshop Sponsor:



Virginia Department of Game and Inland Fisheries

All Department Divisions, including Wildlife, Fisheries, Wildlife Diversity and Law Enforcement will provide instruction during the workshop. Activities will include cannon netting, bald eagle surveys, electrofishing and outdoor education.

Partners:



Virginia Commonwealth University – VCU Life Sciences

The Rice Center for the Environmental Life Sciences www.vcu.edu/rice is VCU's outdoor laboratory and classroom for all things ecological. Located on the tidal James River, the Rice Center supports a wide range of environmental outreach and research activities. For more information on environmental programs and teacher workshops, visit www.vcu.edu/cesweb and www.vcu.edu/workshops.



ESRI

The workshop will help teachers, and their institutions use geospatial tools, including Geographic Information Systems, to answer significant questions and will be a perfect catalyst for the Commonwealth's initiative to include Geospatial Technology in the SOLs. ESRI's 6-12 program will make available teaching resources that promote these initiatives. For more information, please visit: <http://www.esri.com/industries/k-12/index.html> or contact Robert Rike at rrike@esri.com

For More Information

About the Upcoming 2006 Summer Workshop

To be Held July 9-14, 2006, Contact:

Tom Wilcox, VDGIF, (804) 367-6892 or e-mail Tom.Wilcox@dgif.virginia.gov.

Cathy Viverette, VCU-CES, (804) 828-2428 or e-mail cbvivere@vcu.edu.

Visit the following Web sites: www.vcu.edu/workshops or www.dgif.virginia.gov

For Virginia Wildlife subscription calls only 1-800-710-9369
Twelve issues for \$12.95

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